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A Longitudinal Fiscal Analysis of the K-12 Minnesota Funding Formula From the Fiscal Years 2012 and 2018

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A Longitudinal Fiscal Analysis of the K-12 Minnesota Funding Formula From the Fiscal Years 2012 and 2018

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Dedication

This dissertation is dedicated to those who supported me through this process. To my wife Melissa and to my children Brycen and Azylen.

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Abstract

Over the past few decades, modifications and laws have been put in place that has affected the Minnesota funding formula. The purpose of the study was to do a statistical analysis of the general education revenue trend data in regard to the fiscal equity and wealth neutrality. The study focused on a longitudinal study of previous equity studies done in the state of Minnesota. The actual research focused on 331 public operating school districts in Minnesota and the general education revenue trend data relative to wealth neutrality and fiscal equity based on the additional legislation extending the school board's ability to levy up to $724 per pupil through the addition of local optional revenue and board approved levy. Recommendations to improve the fiscal equity of the funding formula were created and an analysis occurred to determine whether recommendations from the most recent fiscal equity and wealth neutrality study (Larson, 2014) related to the actual modifications done to the funding formula over fiscal years 2012 and 2018. The statistical measures utilized were variance, permissible variance, coefficient of variation, and Gini Coefficient.

Chapter 1: Introduction

Lueken and Shuls (2019) stated that over the last 30 years, the K-12 educational system in America has experienced a time of expanded educational choice (p. 1). As a result of this choice it has become important for lawmakers to remain committed to creating solid educational programming that can ultimately meet the various students' needs. The goals of public education must evolve with the changing world, and as a result schools need to prepare students for college, career, and civic engagement. Ensuring that educational opportunities exist is critical, especially as the nation becomes more diverse. Most state constitutions include some language indicating that education is the state's responsibility and a critical public service, and federal policymakers have long recognized that education strengthens the nation. The K-12 public schooling system should meaningfully prepare all students, including the most disadvantaged. This is key to ensuring America's next generation of leaders. Without a sound educational system, society would lack a qualified citizenry.

On November 6, 2018, Tim Walz was elected as the 41st governor of the state of Minnesota. During his campaign, he ran on the concept of "One Minnesota" and the importance that education would play in that plan (Walz Flanagan for Minnesota, 2018). Governor Walz had a vision of providing access to a high quality education for every student in Minnesota, no matter the student's race or zip code. It is the goal of the governor to close both the funding and achievement gap while ensuring that every child has access to a good teacher, can receive one-to-one attention, and has the ability to access instructional materials he or she needs to develop and enhance his or her knowledge and skills to be successful in today's global economy.

How is the state of Minnesota K-12 funding formula equipped to accomplish Walz's "One Minnesota" education goals? Magan (2019) reported the state of Minnesota already spends

over $13 billion a year on public schools with 95% of that funding coming from either state or local taxpayers (p. 1). In the state of Minnesota, the bulk of the funding for local school districts comes from the state through equalized formulas that are used to determine what each local school district generates in terms of revenue. Beyond the per-pupil formula, many of the other formulas are equalized and are influenced by the local district's property wealth, which is determined by the county where the local district resides. Once the property values are set by the county for the local school districts, the Minnesota Department of Education reviews data that is specific to the local school district and determines any additional funding through categorical aids based on the needs and capacity of the local school districts. For example, categorical aids such as compensatory and English learners (EL) help to generate increased revenue for schools that have a greater number of students who qualify for free and reduced meals and programming.

Ensuring equity and adequacy of education funding are two complex challenges that face state lawmakers. How a state chooses to distribute the revenue to local school districts is based on education governance. The state of Minnesota also has the same challenges in terms of distributing revenues both equitably and adequately. Minnesota distributes revenue through a basic formula allowance on a per-pupil payment and categorical funding. The per-pupil payment is intended to cover the basic costs of education while categorical funding is intended to target specific areas. For example, categorical funding can be targeted for programs that are intended to support English learners, special education, and many others. The basic education formula, combined with specific categorical funding, is distributed to local school districts to address both equity and adequacy.

Statement of the Problem

Jordan and Lyons (1992) stated that in recent years diverse social, legal and economic concerns have significantly brought renewed attention to public schools financing (p. 7). With

this in mind, states have created very complex finance formulas to respond to the educational needs of the students. Evans, Murray, and Schwab (1999) stated the majority of the funding for public schools has been provided by the local governments (p. 72). Property taxes have traditionally been the source allocated to education, and because of this, many have argued that this system of funding is not equitable. This educational analysis examines the topics related to financial equity required for funding K-12 public schools with an emphasis on the state of Minnesota.

Since provisions of education are included in the constitution of every state, many individuals feel that the inequitable funding violates the equal protection clause. Jordan and Lyons (1992) stated that school finance systems vary considerably as they attempt to attain the goals of equity, adequacy, and local choice (p. 31). In Minnesota statute, it is stated that education must be fully funded and it is the duty of the state (Minn. Const., art. XIII, § 1). Dehmer (2018) stated that since 2003, the general education revenue has not kept up with inflation (p. 8) calculated on the basis of the Consumer Price Index. At the Truth and Taxation presentation, Dehmer (2018) stated that in order to keep up with inflation per-pupil funding would have to increase by $596 or 9.4% (p. 8). Kaul (2017) reported that K-12 education expenditures accounted for roughly 42 percent of the State of Minnesota's general fund budget (p. 2). Strom (2018) reported that there are 331 public school districts in Minnesota that receive state funding to carry out the mission of educating over 953,014 students (p. 4).

Increasing the general education funding formula to catch up with inflation would require an additional $596 per student. Since the general education formula is below this level, it makes the deficit in special education funding even more challenging to overcome. Dehmer (2018)

stated $697 million statewide or an average of 40% underfunds Special Education funding, and this shortfall equates to around $5,783 per special education student (p. 10).

The lack of consistent funding from the state has forced school districts to make-up the shortfall on the backs of the local taxpayer. In addition, Minnesota currently uses a 90-10 payment to school districts. This means that the school district receives 90 percent of its revenue in the current fiscal year, with a 10 percent cleanup payment the following fiscal year. In the 2008-2009 school year that 90/10 shift went to a 70/30 shift so the state of Minnesota could meet its obligations. Unfortunately, this forced many school districts to borrow money through aid anticipation certificates or from their fund reserves to meet their obligations. For example, that 70/30 shift forced Moorhead Area Public schools to borrow $8.5 million during the 2011-2012 school year. As a result of the economic downturn, the state could not afford an increase of the basic education formula payment. The lack of an increase to basic education formula resulted in an increased reliance by school districts on local levies to fill the operational gap in funding.

Chronic underfunding of both general and special education combined with unfunded mandates from both the state and federal level forced local districts to bridge the deficits through transfers from the general fund to cover the special education costs of programming. Ultimately, this transfer from the general education program to cover the deficits in special education leaves the general fund with a lack of funding. In order to cover these deficits, districts were either forced to cut regular education programming or increase the local levies in communities. As a result, many districts in the state of Minnesota have done both to cover the operational shortfall.

Dehmer (2018, p. 11) explained that in 1993, 65% of Minnesota school districts in Minnesota had an operating referendum that averaged $332 per pupil, and by 2011 that number increased to 89.6% of school districts having an operating levy in place. In addition, in the fiscal

year 2018, all Minnesota districts had an operating levy in place averaging $1,296 per pupil, which equates to 20.5% of the general education formula allowance. Of the $1,296 per pupil, $879 was either board approved or voter approved. In 2013, the Minnesota legislature recognized that the state contribution to the per-pupil funding formula was not keeping up with inflation and granted the local school boards an authority to levy up to $724 dollars per pupil. This change in legislation was a welcomed change, as this provided immediate support to those districts that could not pass an operational referendum, although, for districts that had an operating referendum in place, this change did not provide the district with new revenue. This $724 per pupil was also a welcome change for districts that already had an operating referendum in place and needed to renew their existing operating levies. For example, the Moorhead Area Public Schools already had an operating referendum in place that was approved in 2009 for $948 per pupil for an eight-year period. As a result of the new legislation, the Moorhead Area Public School Board would only have to ask the voter for approval of $224 per pupil upon renewal. As a result, the Moorhead Public Schools went out for a ten-year renewal of $224 per pupil, rather than the $948 per pupil (Dehmer, 2018).

The allowable levy amount of $724 per pupil is broken down into two parts. The first part is $424 per student and the Minnesota Department Education puts this $424 per pupil onto a district's levy limitation sheet automatically. In order to reduce this amount, the board will have to directly reduce this amount. The second part is known as a $300 per student board approved levy. With this specific levy, the school board has the authority to put this levy into place for up to five years. If the board chooses to utilize the $300 per student levy it needs to be renewed once every five years. The Board can elect to under levy the $424 per student levy that is

automatically placed on the local levy and is addressed on an annual basis. The $224 per pupil voter-approved levy is addressed every ten years and renewed by the vote of the local taxpayers.

Kaul (2017) stated that in Article XIII, Section I of the Minnesota State Constitution, the stability of a republican form of government depends on the intelligence of the people, and it is the duty of the legislature to establish a general and uniform system of public schools (p. 2). Minnesota's funding system is a complex system with formulas built on a combination of equalized formulas. "Equalized" means that there is a combination of state aid and a local levy that make up the revenue within a specific formula. There are also formulas that are 100% local levy, and formulas that are 100% state aid. In Minnesota, the formulas that calculate a school district's revenues are based on both student populations and local property values. Since these formulas are based on student populations and local property values, it becomes difficult to control the increase in local levies. As a result, school district officials must be able to clearly advocate how the impact of the student population increase or decrease, the increase or decrease in property values, and the impact of the basic education formula payment affect the overall revenue and ultimately the programming for the district.

Inequalities within Minnesota school systems and the funding formula continue to exist, and because local referendums are based on property taxes, the school districts' wealth inevitably can impact the dollars generated. The Minnesota Rural Education Association (2019) stated, "public schools in rural Minnesota receive $683 per pupil less than districts from the metro area districts" (p. 1). For example, Hawkins (2011) claimed that on a $100,000 property, a tax of $200 value brought in revenues of $1,890 per pupil unit within the Minnetonka Public School System. That same tax in Forest Lake, MN, brought in only $725 per pupil while the owner of a $100,000 home pays $125 (p. 2). Examples such as these make it even more apparent that local

property values clearly display the challenge to equitably funding schools when the district property wealth is a determining factor.

Purpose of Study

Due to the complexities and variances of state school funding systems and legislative education across the United States, this particular study focused on the state of Minnesota and examined the effect of policy change on wealth neutrality and fiscal equity from 2012 and 2018. This study was similar to the five previous equity studies completed within the state of Minnesota.

This study was motivated by three research questions that are feasible, because the data that was reviewed and studied is considered to be public data produced by the Minnesota Department of Education and included all Minnesota public school districts. This study replicated Larson's (2014) dissertation study of fiscal equality and wealth neutrality. The three primary research questions from Larson's (2014, p. 8) study were used and updated to include new data for this study:

1. Based on an analysis of the 2017-2018 general education formula, what were the characteristics of the wealth neutrality and fiscal equality of school districts in Minnesota?
2. Based on an examination of like data elements from the five major Minnesota fiscal equality and wealth neutrality studies, what trends can be observed?
3. Based on the recommendations of previous studies, what legislative impact did they have?

Significance of the Study

Over the past few decades, changes have been made to Minnesota school funding formulas. The goal of this study was to do a statistical analysis of a select number of revenue

sources to test the equity level of those revenue sources currently and review the previous studies findings and recommendations to see how equity has been improved over those years.

The purpose of the study was to do a statistical analysis of the basic education formula trend data relative to the wealth neutrality and fiscal equity. The study focused on a longitudinal study of previous equity studies that were completed in the state of Minnesota. The actual research focused on 331 public operating school districts in Minnesota and the general education (foundation) formula trend data relative to wealth neutrality and fiscal equity based on the additional legislation extending the school board's ability to levy up to $724 per pupil through the addition of local optional revenue and board approved levy.

Recommendations on how to improve the fiscal equity of the funding formula were created along with an analysis of how Larson's (2014) recommendations related to the actual modifications done to the funding formula over the fiscal years 2012 and 2018. The statistical measures that were used are coefficient of variation, permissible variance, variance, and Gini Coefficient.

Delimitations

The funds disbursement of state to local school districts has been analyzed; the taxation system of Minnesota is used to raise the revenue. The study emphasized the sources of revenue, as they are relatable to wealth neutrality and fiscal equality within the state of Minnesota. The following delimitations were used:

1. Only public schools that were in operation in Minnesota during the fiscal year 2018 school year were included in this study. The analysis focused on the basic general education revenue, transition revenue, equity revenue, basic skills revenue, sparsity revenue, and referendum revenue for 2017-2018.

2. Wealth neutrality and fiscal equity as measures of resources distribution have been examined. Efficiency and adequacy as use of resources have not been evaluated.
3. The focus of the study is on the revenue (inputs) that was received by school districts via Minnesota funding formulas. The evaluation of how the local school district revenue was spent and budgeted revenue sources in terms of the outputs were not included. Therefore, capital equipment improvements and building debt service were not evaluated.

Definition of Terms

The terms used in this study are consistent with those adopted by Carruth (1980), Wilson (1984), Jacobson (1986), Vandal (1997) and Larson (2014). Such terms are also the common terms used in many financial publications to describe and explain many components of K-12 finance in the state of Minnesota. Similar or identical definitions were used for the purpose of comparing the current study with previous studies' findings.

- *Adjusted Net Tax Capacity (ANTC)* – A school district's net tax capacity as adjusted by the sales ratio.
- *Adjusted Pupil Units* – Weighting the average daily membership counts multiplied by the weighting factors established by the state. Adjusted pupil units are also known as weighted average daily membership.
- *Average Daily Membership (ADM)* – Summing pupils on the basis of the number of days in the district school year each pupil is enrolled, divided by school session days.
- *Basic Education Revenue* – "The largest program component, this consists of the combination of state aid and local levy (the basic education formula allowance) multiplied by the adjusted pupil units. The result is the total amount of basic Education Revenue available to the school district" (Larson, 2014, p. 10).

- *Basic Skills Revenue* – A combination of English Learner (EL) concentration revenue, EL regular revenue, and compensatory revenue.
- *Board Approved Levy* – The levies are proposed by the board of education as a specific amount of dollar of new revenue.
- *Categorical Aid* – The state pays revenues to school districts and it is designated for the education of disabled children, transportation and vocational education.
- *Equality of Educational Opportunity* – Ensures to provide equal access to at least minimally adequate school resources.
- *Equalizing Factor* – Adjusted net tax capacity (ANTC) or referendum market value (RMV) per pupil unit factors used to calculate aid and levy shares of revenue formulas.
- *Fiscal Disparity* – The criterion of the standard of equity that tends to imply disparities in per pupil unit expenditures or revenues should be eliminated as well as reduced for the purpose of achieving the equal educational opportunity and fairness.
- *Fiscal Year* – The period of 12 months. The fiscal year runs from July 1 to June 30 for school districts in Minnesota.
- *Formula Allowance* – For per pupil unit, the dollar amount used with the intent of calculating the general revenue of the formula of each district.
- *Levy* – A property tax imposed to generate revenue. A certified levy is collected in the calendar year beginning the January following the December of final certification.
- *Local Effort* – The local taxation provides the amount of revenue.
- *Pupil Units* – A pupil weighted count using average daily membership in the local tax levies and state aid calculation.

- *Referendum Revenue* – The amount of revenue increases over the general education formula allowance that was approved by school district voters in the special election.
- *Resident WADM* – For any school district, the average daily membership (ADM) of all district's resident students are weighted in accordance with the current statute. In Minnesota for the period being reviewed, the weighting is as follows: Kindergarten at 1.0, Grades 1-6 at 1.0, and Grades 7-12 at 1.2.
- *Tax Capacity Classification Rates* – A statutory classification that is applied to the taxable market value to determine individual property taxes.
- *Tax Capacity Rate* - The tax levy amount of each district is divided by the total tax capacity of the district.
- *Wealth Neutrality* – The standard of equity on the basis of the concept that "the quality of public education may not be a function of wealth other than the wealth of the state as a whole" (Coons, Clune III, & Sugarman, 1970). Under wealth neutrality, the school district is allowed to provide the educational services level to be a function of local willingness to tax as long as rates of the equal tax provide equal dollars.
- *Weighted Average Daily Membership (WADM)* - The average daily membership was weighted in accordance with the statutory standards.

Summary and Organization of the Study

Financing public schools has its challenges and those are made even more complex when federal legislation mandates school improvement initiatives. These initiatives are made even more complex when state legislation is enacted to carry out defined initiatives or goals. Due to the state government's role in creating policies, the results of the created policies have a potential impact on how schools are funded. As this study builds upon Larson's (2014) study, the following overview of the subsequent chapters is similar to that of Larson's (2014, p. 13).

Chapter 2 is a literature review that addressed the financial equity of public schools and how this was addressed on the national and state level. The chapter involved a review of historical policies surrounding funding public schools and legal implications in the state of Minnesota related to the funding equity. Chapter 3 focused on the research methodology that is used with the intent of analyzing the wealth neutrality and fiscal equity of the Minnesota funding formula for the 2017-2018 fiscal year. Chapter 4 entailed the detailed description of the study findings regarding wealth neutrality and fiscal equity. Lastly, Chapter 5 included conclusions, a summary, and recommendations for the actions that are developed from the study results. Chapter 5 stipulated that the study likely adds to the ongoing evaluation of the revenue's equitable disbursements, and it informs decisions about the funding of Minnesota's public schools.

Chapter 2: Literature Review

There has been increasing pressure from parents, educational leaders, and politicians to improve the quality of educational programs and services that are provided to students. This demand to improve these educational outcomes stems from the concerns over the students in the United States to remain competitive in the current and future global economy. Wise (2013) stated, "Historically, inequality in education has been a moral issue, but the nation's moral failure to provide all children with an adequate and equal education did not incur a noticeable cost" (p. 2). This has led leaders in the field of education to question the necessary resources to carry out the ever-demanding task of educating the students of today.

Education finance is often thought of as an accounting issue. However, education finance is mostly shaped by our values. Systems of K-12 funding for children in local communities will indicate that as a community there is the desire to serve all students and be provided every educational opportunity possible. Kauffman (2004) stated, "the challenges of equity can be focused at the school district level or the student level" (p. 2). State legislators should consider an educational program that has three important components. Leuken and Shuls (2019) believed those components should include equity, efficiency, and educational opportunity (p. 1).

This literature review contains a summary of the literature relating to financial equity of the K-12 public school funding. This chapter examines research on the funding that public school districts receive based on funding formula structures and how the corresponding characteristics of the funding formulas relate to financial equity.

There have been many articles published on what is the appropriate level of funding needed to both adequately and equitably fund public education. This has been debated in many different venues that have included the political realm, the courts, and the research communities.

These venues have produced many thought-provoking arguments, discussions, and defenses on the success or failure of public education in the United States that involve the concept of financial equity and adequacy. As higher expectations continue to be placed on both the school districts and students, the need to provide quality programming is becoming more important than ever. To make this a reality, there is a focus on two questions: How much revenue is needed to accomplish quality programming? The second questions addressed what is the responsibility of both the federal and state governments in providing those resources?

In the United States the demographics are changing as the percent total of the population has decreased for the whites and non-Hispanics, while the percent total population for the Asians and Hispanics have increased (Driscoll and Salmon, 2013, p.233). As a result of the population change, on December 10, 2015, President Barack Obama signed into law the Every Student Succeeds Act (ESSA) and as a result, the No Child Left Behind (NCLB) Act, (Bush, 2001), was replaced and significantly transformed many portions of Elementary and Secondary Education Act. The main purpose in the passage of ESSA was to assure quality education in all public schools that provide the outcomes needed for both individuals and communities to be successful, by measuring success through individual student achievements no matter the student's ethnic and socioeconomic background. Since ESSA reduces the federal oversight created from the NCLB Act and gives control back to the states, the funding can be distributed in a more adequate and equitable manner to the local education agencies through each state's funding formula. ESSA was established to move away from the previously formed act that created federal oversight. ESSA instead converted it toward a more supportive approach for the purpose of providing flexibility to states and to all public school districts in the country and along delegated more decision making power to those entities.

The law noted that every child has a right to get a quality education, regardless of surroundings that a student cannot control. ESSA was established to remove the achievement gap between white students, students of color, and American Indian and Alaska Native students (Minnesota Department of Education, 2017, p.2). Also, it was designed to eliminate poverty, language differences, nationality, and disabilities as considerations or predictors of students' success and by delivering additional support to students in order to meet their ambitious goal to provide quality education to all public schools.

The difference between ESSA and NCLB is that ESSA covers the rights of all students in public schools regardless of their color, gender, language, and nationality, while NCLB had some controversial issues (e.g. pressure of standardized testing and the impacts of said testing), which led to its replacement with ESSA. Under ESSA, each state is required to implement and develop plans that would address the assessment, standards, school and district accountability, support for educators, support for struggling schools and ensure that a well-rounded education is provided to all students that prepares them for all college and career choices. ESSA's main objective is to place an emphasis on a well-rounded education as a part of their regular school year, week, and day. There is an opportunity for the students to participate in numerous learning experiences from a wide range of disciplines such as social studies, mathematics, language arts, world language, science, the arts, physical education, and many other fields. The federal investment in education increased the share of funding allocated to high-poverty districts. However, the current federal investment does not minimize funding inequities between states, which are greater than the inequities among districts within states (Augenblick, Meyers, & Anderson, 1997, p. 67). These differences are displayed in certain states as they only receive a fraction of funds that students in other states receive. These spending inequities across states

have an impact on and have resulted in overall student achievement gaps when states are compared to each other. As a result, when states and school districts are allowed to spend their dollars to address local needs they have better outcomes, including increases to test scores, increased graduation rates, and other indicators of student growth and achievement.

Inequities go beyond revenue. Core programming has an impact in instructional quality and student performance and is generally unavailable to students in low-income schools when compared to students in higher-income schools. In order to address the challenge head on, school funding debates must go beyond the raw numbers and evaluate whether students have equitable access to the resources needed for success, including early childhood education, quality teachers, and exposure to challenging curriculum.

One example includes improving access to early childhood education to level the playing field for students in poverty who generally start school academically behind their more affluent peers. For example, when compared to their higher-income peers, low-income students start school with a smaller vocabulary by up to 30 million fewer words (Bergland, 2014, p.1). High-quality early childhood education can lessen the differences and have a lasting impact on student achievement.

As a result, the state of Minnesota has replaced the previously NCLB-based system, which was solely based on the test scores, in the favor of the North Star accountability system that placed equity at the center of the school recognition and support. The system is aimed to create well-rounded and equitable learning opportunities across the state for all the students. Also, the basis of the North Star process for prioritization is the multiple measures of evaluation that comprise progress and achievements on state test over time, progress towards proficiency of

English language for students who are learning English, consistent attendance, and 4 and 7-year graduation rates (Cox, 2018, p. 1).

In an effort to better understand the overall success or failure of students in obtaining an education in the public schools of today, it is important to review and understand the history of public education from both a funding and litigation lens. This chapter will review various funding mechanisms that are used by each state to distribute aid to local districts. This chapter will also review past litigation that had impacted funding formulas at both the state and local levels. Lastly, because this dissertation is specific to the state of Minnesota, information is specific to its history with K-12 public school funding.

The purpose of this study was to replicate a previous study that completed a statistical analysis of the general education formula trend data in regard to fiscal equity and wealth neutrality based on the legislative changes to the general education formula since the fiscal year 2013. This study included all public school districts in Minnesota and compared the same measures of fiscal equity and wealth neutrality as used in previous studies. The tests for fiscal equity and wealth neutrality were applied from the fiscal year 2013 to the fiscal year 2018. The results from this study were then compared to Larson's (2014) study to compare and contrast the current system of funding schools to the findings from the previous studies. The formula that was applied is consistent with Larson's (2014) study of fiscal equality and wealth neutrality.

This specific study utilized a quantitative approach and consisted of a statistical analysis of the general education formula, obtained through retrospective data collection that was consistent with Larson's (2014) data collection instrument. The Minnesota general fund aid and levy revenue 2007-2021 data report was the specific instrument used to measure fiscal equity and wealth neutrality. This study also included previous longitudinal and equity data from Larson's

study. Larson's study used three different tests to measure fiscal equity wealth neutrality with the Minnesota general education formula. The tests used were: variance, permissible variance, and coefficient of variation. The data studied were average daily membership per average daily membership (ADM) for the general education formula. The revenue streams within the general education formula are: general education aid, compensatory, English learner, teaching and experience, sparsity, equity, transition, and referendum.

Larson's (2014) study used the recommendations of Berne and Stiefel (1984) for the basis of the statistical devices needed to analyze the Minnesota funding formula. Berne and Stiefel (1984) established the rationale for the use of the variance, permissible variance, coefficient of variation, and Gini Coefficient in the study of school equity.

The goal of achieving financial equity in public school funding is the most discussed topic within the body of research, but the solution to achieving financial equity is even more difficult to attain. Currently, there is not one commonly accepted definition of financial equity in education. Larson (2014) defined financial equity as equal revenues to be available for each specific source of revenue and that these revenues not be a function of the school district wealth, but rather a function of the wealth of the state as a whole (p. 65). From a student perspective, equity means adequate funding to ensure equal access to educational opportunity. From the taxpayer perspective, it means taxes should be fair among the tax bases.

The United States Constitution makes no reference to the federal government supporting public education and as a result that responsibility is deferred to the states and local governments through the Tenth Amendment of the United States Constitution (Augenblick et al.,1997). Litigation has heightened awareness of the importance of fiscal equity in education and spurred necessary change in states across the country. The U.S. Supreme Court struck down *San Antonio*

Independent School District v. Rodriguez (1973) by arguing that education was not a guaranteed federal right. Some litigants continue to attempt to overturn *Rodriguez* in order to establish a federal right to education, but until then, many advocates turn to the states. Numerous state courts have reinforced meaningful provisions in state constitutions and required legislative action to improve educational opportunities for all students (Augenblick et al.,1997).

Augenblick et al. (1997) referenced the federal government's role in funding education to be minimal, and it is entirely categorical. It is because of that limited role the federal government's share in educational funding is roughly 7 percent (p. 66). Augenblick et al. (1997) stated that the "state's role in education began in the colonial period" (p. 64). These schools were organized in various ways, ranging from being sponsored by trading companies that supported colonization to private endowments. As colonies became states, their legislatures allowed local communities to create school districts to provide free education even if there was little or no public support until states added language in the states' constitution that supported the fiscal obligation to local school districts. Augenblick et al. (1997) noted that from 1889-1890 states assumed 21 percent of the cost of elementary and secondary education (p. 67). From 1933-1934 the state share was between 16 percent and 23 percent. Augenblick et al. (1997) also referenced that from 1935-1936 that share moved up to 29 percent and since the 1970s that state share of responsibility has not fallen below 70 percent (p. 67).

The state's share to cover the educational costs increased well into the 1970s. Dayton and Dupre (2006) claimed, "education is the most important responsibility of the state and local governments" (p. 23). Dayton and Dupre (2006) argued this responsibility of education is to "provide people the opportunity to obtain skills in life" (p. 27). All states, with the exception of Mississippi, have provisions in their constitutions detailing how each state will provide public

education. Rebell (2002) stated that as a result of the states taking on this responsibility, most have language in their constitution that support the organization and development of a system of free and common schools (p. 75). This common school movement did not receive broad public and financial support until later in the nineteenth century. The U.S. Supreme Court ruled in *San Antonio Independent School District v. Rodriguez* (1973) that public education is not a fundamental right in the national constitution (Larson, 2014, p. 15). Instead, it found that education was an important but voluntary service provided by the government, arguing that while the Constitution does guarantee its citizens the right to vote, it does not guarantee that individuals should be able to exercise this right to the best of their abilities or at their highest potential. Therefore, according to the court, an education of the highest quality is not necessary for the proper exercise of rights. This ruling did, however, say that it was the state's responsibility to choose the funding structure. Petrilli and Roza (2011) stated "funding formulas and myriad state laws and regulations have an enormous impact on the spending decisions that local districts make" (p. 2).

State governments have provided the majority of the funding for public schools. Property taxes have traditionally been this source allocated to education and because of this many have argued that this system of funding is not equitable. The structure of funding formulas is different from state to state. Individual state legislatures are free to choose the funding structure that disperses the funds most equitably. A 1977 New Hampshire lawsuit further addressed equal funding, this time initiating litigation on property taxes. In *Claremont School District v. Governor* (1977), the New Hampshire Supreme Court ruled in favor of the plaintiffs, who argued against the state's disparities in funding. The court concluded that because the duty to provide education is a state and not a local matter, any property tax levied for schools is a state tax and

not a local tax. Furthermore, it was the state's obligation to provide a minimum standard of education. The court's ruling, however, left open the opportunity for local schools to rise above that minimum, stating that once the minimum standard is satisfied, local districts may levy property taxes to generate supplemental funding. The New Hampshire ruling addressed the discrepancies of using property taxes as well and stated that the state had an obligation to a minimum standard of funding. By allowing school districts to raise funds above the minimum level, however, the court left the door open for future funding discrepancies. This court ruling is one factor that began a litigation shift away from equity towards adequacy and fairness.

In regard to school finance, Jordan and Lyons (1992) argued that there are four essential questions to be answered in regards to school finance: what or who to fund, what amount to fund, where to get the money, and how to share the funding among different levels of government (p. 7). The authors contend that equity is determined by how a state chooses to answer these questions. However, Toutkoushian and Michael (2007) noted, "there is no consensus in the education community about the best way to measure the cost of providing an adequate education" (p. 396). Verstegen and Knoeppel (2012) claimed that, historically, funding to local K-12 public school districts has been accomplished through four main structures: flat grants, foundation programs, equalizing plans, and full state funding (p. 151). Table 1 delineates which states utilize these funding structures according to Verstegen and Knoeppel (2012, p. 151).

Funding Formula Structures

Verstegen and Knoeppel (2012) stated that states continue to use funding policies developed in the past but states are now putting in weighted systems and other mechanisms that aim to reduce the differential costs across students and local districts (p. 145). Ellwood Cubberley, as quoted in Verstegen and Knoeppel (2012), noted, "what is a slight effort for one community is an average load for another and an excessive burden for a third" (p. 145).

Cubberley's quote described the challenge when trying to create an educational funding formula that is both adequate and equitable. It is the responsibility of the state to ensure that a high standard is available for all, but not reduce those same opportunities to a minimum. It becomes standard to equalize the advantages to all students with the resources possible.

Flat Grants Program

The first funding structure and one of the earliest forms of K-12 public school funding was the flat grant. The flat grant was adopted early on by many states. The mission of the flat grant program was to provide every district the same amount per pupil. Since the per-pupil payment was distributed equally across districts, the state didn't identify if the local school district was wealthy or poor. The program's structure did not allow for differences and all school districts were treated equally (Augenblick et al.,1997). Therefore, flat grants do not consider any mitigating circumstances for individual school districts, which often magnified already existing inequalities. The number of students calculated the local district's entitlement from the state in attendance (ADA) or membership (ADM) by a fixed dollar amount per pupil. According to Larson (2014), the flat grant funding structure does not account for the local school district's ability to generate additional funds for the differences in the cost of educating students. "Local public school districts receive the same amount of money per a designated characteristic" (Larson, 2014, p. 15). As a result, flat grants do not take into account any circumstances for any local school district that have the potential to enhance any inequalities that may already exist between districts. Augenblick et al. (1997) made the connection that over time using this approach has fallen out of favor as a wealthier district was able to offer smaller class sizes and receive more state aid per student than a district that is considered poorer with larger class sizes (p. 67).

Foundation Program

Augenblick et al. (1997) stated that in the 1920s, a new approach was started to distribute state aid (p. 65). In 1923, George Strayer and Robert Haig created the foundation plan out of the research of school finance. Their research focused on revenue that could be distributed equitably between school districts. Fahy (2011) stated, "a well-designed foundation formula should not only ensure adequate funding levels but lead to horizontal and vertical equity across districts as well" (p. 217). The foundation program is believed to be the most popular of the funding structures. This funding structure ensures that all local districts have a "minimum" or base level of funding per pupil. Augenblick et al. (1997) stated that the foundation program in its simplest form requires all districts to tax local property at a specified minimum rate (p. 65). The state aid would be considered only after the difference was calculated based on the local tax rate. Another large variance in the foundation program structure is how the students are counted across the states. For example, Verstegen and Kneppel (2012) found that Utah has weighted student units with additional funds for districts that are considered rural or a sparse district, while Wyoming elected to utilize a recapturing mechanism for its local school districts. Verstegen and Kneppel (2012) conducted a funding structure analysis in 2011 and found that thirty-six states use some form of a foundation program as denoted in Table 1 (p. 151). Larson (2014, p. 16) summarized Verstegen and Kneppel's (2012) foundational program features into four central components:

1. Funding is built around the "rich district" idea. Each district would levy the amount of local tax that was required to provide a minimum program; the state would then kick in the funding needed for the "poorest district" to reach that minimum program level.
2. All foundation programs should guarantee the equality of educational opportunities up to a specific point.

3. Uniform property assessment across the state was essential in all foundation programs.
4. The foundation program should be a minimum and not a maximum program.

The foundation plan is not without opposition. According to Larson (2014):

> Because the plan leaves open the ability of districts to raise funds above and beyond the minimum level, it again opens the door for inequities. Foundation plans also do not take into account any equalization; therefore, wealthy districts could theoretically raise the funds needed to meet the foundation at a lower tax rate than a low property value district. Because of this shortcoming, some analysts have characterized the foundation plan as an "equalization myth" (Augenblick et al., 1997). Although the plan appears to have the potential to ensure equity across school districts, it inevitably results in the same inequality it was designed to remedy. (p. 17)

The foundation program relied heavily on the state for its share of the per-pupil payment. The challenge is: what happens when the state is not able to fulfill its commitment to local school districts? When a state falls on hard times and can no longer contribute to the minimum amount per pupil, this forces the local district to make up the difference that the state can no longer contribute. In this scenario, some local school districts would not have the ability to make up the difference depending on the rule that is allowed by each state. When the state of Minnesota fell on hard times and could no longer increase the per-pupil payment to keep up with inflation, many districts were forced to choose between laying off staff or to going out and seeking additional operating dollars that needed to be voter approved. Many school districts across Minnesota were forced to go to the local voter to support making up the difference. As a result, many districts could not pass an operating levy. This inability to generate additional local funds to fill the "gap" made equitable funding almost impossible.

Equalization Program

The third funding structure that has been utilized is the equalizing plan. Examples of the equalization plan are district power equalizing (DPE) and percentage equalizing (PE). The main purpose of equalization is to reduce or close the funding gap between property-wealthy school districts and property poor districts (Larson, 2014, p. 19). As a result, the state that utilizes an equalization program will provide payments from the state to local school districts that will vary based on the taxing effort for districts of similar wealth. In theory, that state payment would be greater for a district of less property wealth when compared to the district of greater property wealth.

In Larson's (2014) study he referenced the following example of a district power-equalizing (DPE) plan. It went as followed:

> If the state sets a levy dollar amount of $1,000 for a given levy tax rate, and if the local school district raises only $600 through the set levy tax rate, the state would then offset the amount with $400 state dollars to reach the state set level. Likewise, if a district reaches or exceeds the minimum $1,000 through the set levy tax rate, they would receive no state equalizing funding. In some plans, if a local district raises above the minimum level, say $1,250, the amount over the amount set by the state would be taken and placed back into the state's general fund. This fund then is to pay equalizing dollars to districts under the state set level. This is known as recapture or the "Robin Hood" plan. (p. 19)

DPE means that each local district levy should produce the same number of dollars of total school revenue per weighted student in every district, and the last dollar to be levied should produce the same total funds as the first one (Jordan & Lyons, 2012). Verstegen and Knoeppel (2012) explained that district power equalization (DPE) systems support taxpayer equity by providing similar tax rates across the state (p. 153).

Full State Funding Program

A fourth funding structure called a full state funding program (FSF) is utilized the least when compared to the other funding structures (see Table 1). According to Larson (2014), in the FSF program, all the funding for the local district comes from the state with no local tax revenue collected to support the local education agency (p. 17). The FSF program has the advantage of providing both the taxpayer and pupil equity. Larson (2014) further points out that Hawaii is the only state in the country currently using the true form of FSF and accomplished this because the entire state of Hawaii is considered one large school district (p. 17).

Larson (2014) claimed some believe that the FSF program is the most equitable plan because "the wealth of the local school district has no relationship to the amount of funding it receives" (p. 18). There are very few states that have funding programs that are simple and transparent. Most funding programs in education rely on formulas and calculations that are derived from many years and legislative changes to state laws to help determine and create appropriate funding levels. These funding formulas and state law changes lend themselves to have a great impact on the spending decisions that local school districts can make.

Reynolds (2009) stated, "All state constitutions have been interpreted as requiring state taxes to be uniform" (p. 767). Local property tax rates that are created for the purpose of generating school revenues are lacking consistency. It is because of the inconsistencies of property wealth across local communities that districts differ in their abilities to generate revenue. To illustrate this point, Larson (2014) drew upon the *Seattle School District No. 1 v. State* (1978) stating:

> The state of Washington created a self-described full state-funding plan in response to litigation brought against the state in 1978 (*Seattle School District No. 1 v State*, 1978). This litigation dealt directly with the inequities in the abilities for poor communities to

raise funds in comparison to wealthy districts. At the time of the case, some wealthy districts had the ability to raise funds so that up to 24% of their budget came from local taxes, compared to just 8% in a district with low property value. In Washington's plan; however, local school districts could supplement their budgets with local levies. Because the districts had the ability to raise local funds, the gap between districts actually grew as some property rich districts were able to raise enough funds so that up to thirty percent of their budget was from local taxes (Reynolds, 2006). (pp. 17-18)

Table 1: State School Funding Formula Structures in 2011

Funding Formula Type	*n*	State
Foundation Program	36	AK, AL, AZ, AR, CA, CO, DE, FL, ID, IN, IA, KS, ME, MA, MI, MN, MS, MO, NE, NV, NH, NJ, NM, NY, ND, OH, OR, PA, RI, SC, SD, TN, VA, WA, WV, WY
District Power Equalization	3	CT, VT, WI
Full State Funding	1	HI
Flat Grant	1	NC
Combination/Tiered System	9	GA, IL, KY, LA, MT, MD, OK, TX, UT
Total	50	

Note. Adapted from "From Statehouse to Schoolhouse: Education Finance Apportionment Systems in the United States," By D. A. Verstegen and R. C. Knoeppel, 2012, *Journal of Education Finance, 32*(2), p. 151.

Equity Measures

Kauffman (2004) stated, "cases are usually based on the equal protection clauses in the state constitution" (p. 1). Since the funding of education has become a function of state policymakers, the issue of providing an adequate and equitable education has been elusive since no one can seem to identify what defines adequate. Thoreson and Edmondson (2000) noted that most states provide a fixed amount of revenue per student, no matter the number that the school

district serves (p. 2). This logic implied that school costs are based on a per-pupil model regardless of the number of students enrolled in that school district. The inability to identify a true cost to adequately and equitably educate students is a question that has yet to gain consensus among policymakers and educators. Thoreson and Edmondson (2000) believed this because policymakers viewed educational funding for schools through a "linear model" (p. 6).

Thoreson and Edmondson (2000) identified two principles of equity from this linear logic, horizontal and vertical equity (p. 6). Horizontal equity is based on the philosophy that all students who are equal should have equal access to the same resources for each student in the state. The principle of vertical equity assumes that the needs of all students are not equal and therefore should receive the various levels of resources. The principle of vertical equity is identified through the use of some sort of categorical funding mechanism. This includes an allowance for categorical resources such as special needs, students living in poverty, students of various racial backgrounds, and students living in remote areas. Larson (2014) identified that vertical equity has been associated with an adequacy movement since it is grounded in the concept of differential treatment of the students (p. 20). As a result, vertical equity does not accept the linear approach and has been the movement most closely affiliated with the concept of adequacy.

History of Minnesota's State Funding

The Minnesota State constitution allows its residents a right to an education through a "general and uniform" public school system (Thorson and Anderson, 2006, p. 27). The support provided by Minnesota for secondary and elementary level of education is distributed by general education revenue to the local school districts. The amount funded by the general education program is for the purpose of operating expenses of local districts. However, the rest of the appropriations are scheduled from the state through categorical aids. The amount of categorical

aid to school districts is controlled by state statute through equalized formulas that are set by the legislature. These formulas allow local districts to levy the funds locally, but these revenues are limited based on property tax values and the district's average daily membership. Currently, the state still provides funding for the operation of the state's public elementary and secondary schools in Minnesota. Public school finance in Minnesota has shifted between various combinations of state and local funding.

Historically, the school boards have levied local property taxes that have provided revenue to local school districts. This ability to levy a tax on the local property owner has been the primary revenue source for the local school district to generate operational dollars. It was not until 1900 that revenues from the state supplemented the local property taxes (Minnesota Department of Education, 2018, p.2). Although the revenue was limited at the start, it was the beginning of state appropriations being distributed to local districts.

Minnesota School Finance History 1849-1914

In 1849, Congress reserved the 16th and 36th sections of land to be used by the public schools. The first law was created stating common schools were to be open to all people between the ages of four and twenty-one years old, and townships were split into local school districts when they had more than five families (Minnesota State Department of Education, n.d., p. 5). In order to support these newly created school districts, the law allowed for a levy of two and a half mills along with a tax of 15 percent of the revenue collected from liquor licenses and fines from crimes.

Before the formal education movement, there were only three schools in the state with a student enrollment of fewer than 250 students that included courses such as reading, writing, geography, and some mathematics (Minnesota State Department of Education, n.d., p. 5). This formal education movement evolved slowly until Minnesota became a state in 1858. Once

Minnesota became a state, one of the first accomplishments of the legislature was to appoint a state superintendent of public instruction. In 1861, the state created legislation to ensure that all townships would be a school district. The plan that was created in 1861 lasted only one year and quickly moved to the current system we have in place today. As a result of this movement, in 1862, school districts were no longer allowed to charge tuition. This change resulted in rapid progress when compared to the growth of the territorial period (Minnesota Department of Education, 2018, p. 1).

State financial aid allocated to education before the 1900s was inconsistent. State leaders soon realized that without state support for education it would not make any progress. As mentioned earlier in this chapter, public education in the United States is the responsibility of the state government. Storm (2018) stated that in the state of Minnesota, the constitution "charges the legislature with the responsibility for public schools" (p. 1). Prior to the 1900s, the state of Minnesota established a permanent school fund that produced revenue for schools through the sale of land granted by the United States and through other cash investments. This fund, in 1877, had grown to over $3.4 million dollars and the schools were funded from the proceeds off of the interest (Minnesota State Department of Education, n.d., p. 7). State aid was started for high schools that maintained a minimum program of study combined with an organized school calendar. Over time this evolved as the categorical aids were increased to include aid to junior and senior high schools (Minnesota Department of Education, 2018, p. 1). In Minnesota, education started to become more formal with the creation of compulsory attendance laws. While this law required students to come to school, it exempted students from families that could not afford clothes, students with disabilities, and students who resided more than two miles from high school. Larson (2014) mentioned that in 1887 the state property tax levy was instituted as

another mechanism for supporting education (p. 37). Larson (2014) claimed the revenue collected as a result was distributed to the local districts in direct relationship to the number of pupils in attendance for at least 40 days with a qualified teacher (p. 37). During this time of growth and an increase in state support given to local schools, the state soon gave incentives that promoted districts to encourage consolidation. These incentives included transportation aid and matching funds that promoted school construction projects. The Minnesota Department of Education (2018) noted that at the time of promoting this consolidation there were over 8,000 school districts in Minnesota (p. 2).

Minnesota School Finance History 1915-1956

The years from 1915-1956 were highlighted with local property taxes being supplemented with flat grants and state equalization aid. In this time period, the state share increased at a steady pace, however, the local taxes continued to provide the majority of the revenue to fund schools. In the early 1900s, the state of Minnesota put into place the concept of equalization aid. Larson (2014) detailed that the concept of state equalization aid officially started in 1915 and looked a lot like supplemental aid (p. 38). Larson (2014) further stated that school districts that had a maintenance levy that was greater than 20 mills were allowed access to this supplemental aid that was equal to one-third of the total generated by the levy above the 20 mills (p. 38). The supplemental aid had a cap that was limited to $1,800 for a graded school and $2,500 for a high school (Minnesota Department of Education, 2018).

Larson (2014, p. 38) explained that the supplemental aid program was revised in 1921 to provide aid that was equal to one-third of the levy between 20 and 32 mills; however, districts that levied more than 32 mills would generate one half of the total revenue through supplemental aid. School districts that raised more than $100 per pupil that levied twenty mills were excluded from generating revenue through this program. The maximum aid that school districts could

generate was capped at $200 per elementary teacher and $250 per high school teacher employed. Larson (2014) detailed that this was the first finance program that attempted to define the difference between property poor and property-wealthy school districts by not allowing districts that could generate revenue through local property taxes to receive any aid through the supplemental aid program (p. 38).

The Minnesota Department of Education (2018) indicated that the supplemental aid program was amended again in 1935 (p. 2). Larson (2014, p. 38) explained that the adjustment to the supplemental aid program in 1935 ensured that a school district that made a regular operating levy of 30 mills would have collected $60 per elementary pupil and $100 per high school pupil in the district's average daily attendance (ADA) from a combination of the levy, the permanent school fund distribution, and special state aids. In 1933, the state of Minnesota created a state income tax that was distributed to local school districts based upon students whose ages ranged from eight to sixteen and resided in a specific local district. The Minnesota Department of Education (2018) explained that in 1937, the local school districts were dedicated ten dollars per student from the state income tax (p. 2).

Larson (2014) identified that in 1947, the state of Minnesota "added a flat grant structure to the funding formula in the form of basic aid" (p. 38). This basic aid was made up of over 40 special aids that were distributed on a per-pupil basis through a weighted pupil unit.

The Minnesota Department of Education (2018) detailed that in 1955, the Bureau of Field Studies at the University of Minnesota was selected to study the school finance system used in the state of Minnesota to fund K-12 education (p. 3). Larson (2014) indicated that from this study, the state was providing 41.7% of the revenues to local school districts, leaving the local

school districts with the remaining share at 58.3% (p. 39). As a result of this commissioning, Larson (2014) reported the following recommendations as a result of the 1955 study:

1. Adopt a foundation-based program. The formula recommended was as follows: Aid = the greater of ($215 x weighted ADA) - (0.012 x equalized valuation) or $92 per pupil unit.
2. The foundation program of education should be defined (i.e.: minimum services to a pupil that should be offered by all schools).
3. There should be a study of pupil units.
4. Increase the state share of state and local school funding to 50%.
5. Establish a state loan fund for school construction.
6. Provide state aid to equalize debt service levies that exceed a certain minimum tax rate. Continue to equalize property values for state aid computations (Larson, 2014, p. 39).

Minnesota School Finance History 1957-1970

As a result of the 1955 study and the recommendations that were created, the legislature in 1957 authorized the foundation program to begin in 1958. The Minnesota Department of Education (2018) identified that the formula allowance was set at $240 per pupil unit, which was 84% of the average adjusted operating cost per pupil unit (p. 4). The minimum aid was set at $85 per pupil unit with the pupil units based on the average daily attendance. Another change that resulted out of legislative changes in 1957 was the weighting of pupil units. Students in kindergarten were given a weighted value of 0.5, elementary students a value of 1.0, and the high school students were given a weighted value of 1.5 (Minnesota Department of Education, 2018, p. 4).

In the 1970s, the state identified that state and local operating costs per pupil varied anywhere from $370 to $903 and school tax rates varied from less than 35 mills to more than 100

mills (Minnesota Department of Education, 2018, p. 4). The Minnesota Department of Education (2018) provided the following example: The community of Anoka was forced to levy $581 on a $20,000 home to spend $536 per pupil, while Golden Valley levied only $369 on a $20,000 home to spend $837 per pupil (p. 4). As a result, the state of Minnesota started to change the foundation aid program. The state of Minnesota provided all Minnesota public schools appropriations for state aid through the flat grant program resulting in a flat payment per pupil. Storm (2018) stated that the state "provided some districts an additional equalized amount that varied inversely with the district's property valuation" (p. 1). Under this new funding mechanism, the state covered 43 percent of the cost of running local schools. Over this time, school district expenditures and tax rates varied across districts.

In October of 1971, a federal court judge ruled in the case of *Van Dusartz v. Hatfield*. This was the first time that Minnesota's school finance system was challenged in the courts and as a result, the finance system was ruled unconstitutional. The litigation proved that school funding varied based on the property wealth of the school district. In the 1971 legislative session, the legislature increased the support from the state by passing a new omnibus tax bill that provided more equalized foundation aid per pupil unit and by also creating a statewide cap on the property tax rate for local school districts. This change in legislation was known as the "Minnesota Miracle." The legislation led to equalized foundation aid based on spending classifications (Thorson and Anderson, 2006, p.28).

Larson (2014) identified two more cases that followed after the *Van Dusartz v. Hatfield* (1971) litigation, *Rodriguez v. San Antonio Independent School District* in 1973 and *Serrano v. Priest* (1971). According to Larson (2014):

> One such case was *San Antonio Independent School District v. Rodriguez* in 1973, in which plaintiffs from some of the property poor districts across Texas sued the state

claiming that the funding formula was unconstitutional because of the resulting disparities among districts. The Supreme Court rejected their argument stating that education was not a fundamental interest under the federal constitution. In his descent; however, Justice Thurgood Marshall specifically recommended that the plaintiffs address their concerns at the state level through a "review of state educational funding schemes under state constitution provisions" (*San Antonio Independent School District v. Rodriquez*, 1973). The Supreme Court's decision had a major impact on future litigation, effectively opening the door to state level lawsuits regarding the funding of public schools.

A second major court case that helped create more equity in school funding occurred two years earlier in *Serrano v. Priest* (1971). In *Serrano v. Priest* (1971), the California Supreme Court ruled that education was a fundamental constitutional right and that the funding disparities between property wealthy and property poor districts generated by the state funding formula violated the equal protection clause. A continuation of the lawsuit was filed in 1976 with *Serrano vs. Priest II*. Once again, the court sided with plaintiffs, stating "equality of educational opportunities requires that all school districts possess the ability in terms of revenue to provide students with substantially equal opportunities for learning" (*Serrano v. Priest*, 1976, p. 6). Both of these cases established a precedent for future litigation involving funding equity. (pp. 25-26)

Minnesota School Finance History 1971-1990

Larson (2014) indicated that the "Minnesota Miracle" was seen as the solution to the current funding inequities (p. 40). Larson (2014, p. 40) indicated that as a result, the following changes were enacted:

1. The state tax increased by 23% or $581 million as the state share of total operating revenues jumped from 43% to 65%. The increased funding came by increasing the tax

rates for state income and sales taxes. However, as a result of this conversion, the dependence on the property tax decreased as much as 20%.

2. The foundation formula allowance increased from $404 in the fiscal year 1971 to $750 in the fiscal year 1973.
3. Uniform statewide levy limits were implemented. The basic tax rates were increased from 20 mills to 30 mills. This prescribed limit could be exceeded with the support of a local referendum vote.
4. Pupil units were converted to average daily membership from average daily attendance. The weighting of the secondary pupil unit went from 1.5 to 1.4.
5. A hold harmless provision was put into place to ensure that no district would lose revenue as a result of the changes made to the formula.

As a result of the past litigation, the 1973 legislative session resulted in the elimination of the flat grant system and established a foundation aid program that created a system to improve aid distribution to local school districts that were considered to be a lower spending district. The goal was to continue to increase the support to these districts over a six-year period (Storm, 2018, p. 1). Over the next ten years, the legislature continued to be responsive to the local district's needs through the adjustments made to the foundation aid formula making it more adaptable to the local tax effort and the state aid being provided.

A new foundation aid program was created in 1983. As a result of the new program, many components were replaced with new optional aids and levies. As a result of the changes, five new tiers were created that were designed to improve access to revenue, recognized the specific cost differences, and provided the local school boards with the ability to identify the

level needed locally to provide an equitable and adequate education (Minnesota Department of Education, 2018, p. 6).

In 1987, the legislature once again made a dramatic shift by replacing the foundation aid program with the general education revenue program. This went into effect for the 1988-1989 school year. The general education revenue program has held constant since its inception and has been justified based on differing needs across the state such as the number of students, demographic characteristics, and other identifiable needs in local school districts (Minnesota Department of Education, 2018, p. 6). The supplemental revenue program was created in 1988 and this revenue provided all school districts with an additional $40 per pupil unit increase for the fiscal year 1989.

The state of Minnesota enacted the mandatory open enrollment program in 1988. This program was slated to begin in 1990 for school districts with over 1,000 pupil units and in 1991 for the remainder of the school districts. The Minnesota Department of Education (2018) identified that as a result of the open enrollment program, procedures for uniform transfers of general education and capital expenditure revenues for students who took part in the open enrollment program were created (p. 7). Larson (2014) acknowledged that this was the first time students could enroll in any school district the student and family selected (p. 41). Although this program now gave families a say in where they could send their child to receive an education, the ramifications of this program impacted school districts financially. The resident district would no longer receive the revenue for the open enrolled student, as the revenue per pupil would now follow the student. Knowles and Knowles (2005) identified another concern under the provisions of the open enrollment program: a homeowner with a preference for spending

higher than average on public education may vote against a local operating referendum since there is a chance to send their child to another school district (p. 5).

Minnesota School Finance History 1991-2000

In the year 1991, there were again modifications made to the funding formula. The major change due to legislation enacted the referendum equalization program that started in 1993. The revenue in this program was equal to 10% of the formula allowance that was $305 in 1993. The Minnesota Department of Education (2018) acknowledged that this was equalized at 50 percent of the equalizing factor (p. 7). Although the program was designed with the intent to provide equalized revenue from the state, the only way a district could gain access to this program was through a successful local referendum vote. If the local school district could not pass a referendum, there was no way of capitalizing on this revenue from the state. In the same year, the debt service equalization program was introduced but vetoed by the governor. Debt service equalization would have provided equalization of the debt levy over the 12% tax rate at 100%. Larson (2014) stated that the debt service levy became a larger part of the equity equation when the Minnesota Supreme Court heard the case of *Skeen v. the State of Minnesota* (1993) (p. 42). The court case challenged if the referendum and debt services levies that are based on local property taxes were constitutional. On December 17, 1991, the Wright County District Court ruled that the referendum levy, supplemental revenue, and the debt service levy violated the education clause and the equal protection guarantees of the Minnesota Constitution (Larson, 2014, p. 42; Minnesota Department of Education, 2018, p. 7).

Minnesota School Finance History 2001-2012

In 2001 the Minnesota state legislature passed a law that eliminated the general education levy and replaced it with the general education aid. This plan resulted in the state replacing the

revenue that was removed from the local share of the pupil payment and eliminated the general education levy (Minnesota Department of Education, 2018, p. 9).

The Minnesota Department of Education (2018) identified that supplemental and transitional revenue was eliminated but could be converted to referendum revenue with board vote (p. 10). In 2001, another monumental change to the funding formula was through what was called a $415 referendum transfer. This $415 was added to the basic formula while $415 per pupil in referendum authority was eliminated. The school districts that received less than the $415 per pupil in referendum revenue gained new revenue as a result of the change.

In 2003, the state shifted the percent of state aid that was released to the schools in the current fiscal year. The state went from a 90/10 shift to an 83/17 shift. This had a negative impact on local school districts due to the state holding more revenue back in the current fiscal year. Essentially, this allowed the state to hold back seven percent more of the revenue and not pay that revenue to school districts until the next school year. This meant that the school districts had to meet all their financial obligations in the current school term thus forcing school districts to take out aid anticipation notes until the remainder of the revenue was released in the next school year. This shift was made even worse in 2012 when the state held back 40% of the school district's revenue forcing the districts to meet their obligations for the current fiscal year on 60% of their revenue (Minnesota Department of Education, 2018, p. 12).

Minnesota School Finance History 2013-2018

In 2013, the general education formula increased by one and a half percent for both the 2014 and 2015 school years. In 2015, kindergarten was fully funded with a 1.0 weighted pupil unit. Since kindergarten was moved from 0.6 to 1.0, the weights were once again adjusted. In 2015, the pupil units were now weighted at 1.0 for students in grades K-6 and 1.2 for students in grades 7-12.

In 2014, all school districts were given access to qualifying for a $424 per pupil optional levy. This revenue, combined with the $300 board approved per pupil levy, allowed all school districts to have up to $724 of board authority levy. This now means that all school districts have the ability to levy up to $724 per student without having to go to the voter for an operating referendum. Many school leaders said this change in legislation was a large win. There were many school districts that couldn't pass an operating levy and this new legislation helped to make that attainable. To make this even more attractive, based on each local school district's property wealth, the amount is equalized (Minnesota Department of Education, 2018, p. 13).

Another program implemented in 2014 was a program called the Achievement and Integration program. This is funding provided to districts on a sliding scale based on the demographics of the local districts. This program also has a levy portion, with a majority of the revenue coming in the form of state aid.

Under Governor Tim Walz's "One Minnesota Plan," the ultimate goal is to make sure that every child in Minnesota will grow up and competes with workers in the global economy (Walz Flanagan for Minnesota, 2018). His mission is to make sure that no matter what your zip code, students deserve the right to an education that prepares them for success in a 21st-century economy. The public schools in Minnesota continue to display great differences in terms of enrollment, local property wealth, and expenditure levels which makes critical the need for the general revenue formula to be more adaptive to meet the needs of local school districts across the state.

In the state of Minnesota, general education revenue with contributions from the local tax base is the primary source of revenue to operate Minnesota's 331 public schools. The main source of revenue, however, continues to be provided by the state. Strom (2018) noted that states

provided approximately 67 percent of the revenue to local school districts, while local property taxes contribute 28 percent (p. 4).

Since the 1900s, there have been a number of factors that have contributed to an increase in the state's fiscal responsibility. These factors range from changes in federal education legislation and the amount of revenue the federal government distributes to each state. In the state of Minnesota, the federal government contributes less than six percent of the revenue to fund education, while over 67% comes from state sources.

The issue of funding schools in an equitable manner is something that has been debated for over a century. Over the decades there have been numerous modifications to funding formulas that have improved the equity of school funding. In times of change, there have been some winners and at times there are school districts that do not benefit from such a change. This study examined such funding changes since Larson completed that last study in 2014. The research design will be explained in Chapter 3.

Chapter 3: Research Design

The purpose of this study was to replicate Larson's (2014) study that completed a statistical analysis of the general education formula trend data in regard to fiscal equity and wealth neutrality based on the legislative changes to the general education formula since the fiscal year 2012. This study included all public school districts in Minnesota and compared the same measures of fiscal equity and wealth neutrality as used in previous studies. The tests for fiscal equity and wealth neutrality were applied to fiscal year 2012 and to the fiscal year 2018. The results from this study were compared to Larson's (2014) study to compare and contrast the current system of funding schools to the findings from the previous studies. Since fiscal year 2012, the Minnesota legislature has made numerous adjustments to the general education formulas. Those adjustments included changes to the per pupil payment and the creation and elimination of categorical aids that make up the general education formula. For example, the Minnesota Legislature created the categorical aid called local optional revenue, while eliminating the training and experience revenue. The formula analysis that was applied to this study is consistent with Larson's (2014) study of fiscal equality and wealth neutrality.

This study was based on Larson's (2014) study and focused on Larson's three research questions:

1. Based on an analysis of the fiscal year 2012 and fiscal year 2018 general education formula, what were the characteristics of the wealth neutrality and fiscal equality of school districts in Minnesota?
2. Based on an examination of like data elements from the five major Minnesota fiscal equality and wealth neutrality studies, what trends can be observed?

3. Based on the recommendations of previous studies, what legislative impact did they have?

In accordance with Larson's (2014) study,

> The purpose of this chapter is to detail the research design that was used to analyze the fiscal equity and wealth neutrality of the Minnesota Public School funding formula. This chapter identifies both the population of study and the data included in the analysis. In addition, the conceptual framework for evaluating the equity of the formula is explained, as well as the fiscal equity measures and the wealth neutrality measures. Finally, the research hypothesis is likewise explained. (p. 66)

This specific study utilized a quantitative approach and was consistent with the statistical analysis of the general education formula, obtained through retrospective data collection, and is consistent with Larson's (2014) data collection instrument. Larson used the Minnesota Revenue Trend data report, a specific instrument used to measure fiscal equity and wealth neutrality. This study also included previous longitudinal and equity data from the Larson (2014) study. The tests for fiscal equity and wealth neutrality were applied to fiscal years 2012 and 2018.

The Population

The following was in accordance with Larson's (2014) study to ensure proper replication and extension and updated to include the new information included in this particular study: The survey population for this study included 331 public operating elementary and secondary independent districts (Type 1 Classification) as derived from the Minnesota Department of Education (Larson, 2014, p. 67; Minnesota Department of Education, 2018). The number of districts in the Larson (2014) study totaled 333; however, this number is not consistent with the current study as there have been consolidations in K-12 public school districts across the state

since that time. The Pine Point School District was also eliminated, as it had no recorded property wealth, consistent with prior dissertation studies.

The Data

The following was duplicated from Larson's (2014, pp. 67-68) study to ensure proper replication and extension of the study and was updated to reflect the new information included in this particular study:

> The statistical measures used in this study were consistent with that of [Larson (2014)] for comparison purposes. Two data sources were utilized: demographic data and revenue data. The demographic data consisted of the name of each school district, the school district number, and weighted average daily membership for the [2012 and 2018 school years.] All demographic data was obtained from the General Fund Aid and Levy Revenue 2007-2021 report (Minnesota Department of Education, 2018). The revenue data included basic general education formula (WADM), basic skills revenue, referendum revenue, and total general revenue. All revenue sources were gathered from [2012 and 2018] data listed from the General Fund Aid and Levy Revenue 2007-2021 report (Minnesota Department of Education, 2018).
>
> The focus of this study was fiscal equality and wealth neutrality. In order to remain consistent with previous studies, the revenue data was encoded using a common statistical treatment [Larson, 2014, p.67]. For data analysis purposes, the scheme R (X, Y) is used where R is the general education revenue, X denotes the revenue source and Y is the fiscal year. Table 2 demonstrates this so that:

Table 2: R (X) Data Analysis Scheme

(X)	Name of revenue source
1	Basic revenue per WADM
2	Basic skills: compensatory revenue
3	English Language (EL) revenue
4	Sparsity revenue (ALL)
5	Equity revenue
6	Transition Revenue
7	Referendum Revenue
8	Total general education revenue

And Y denotes the fiscal year of the data used in the analysis, so that:

0 = the fiscal year ending June 30, [2012]

The coding system produced the following variables [in Table 3]:

Table 3: Variable Codes and Variable Names

Variable Code	Variable Name
R (1,0)	2011-12 General basic revenue per WADM
R (2,0)	2011-12 Compensatory revenue
R (3,0)	2011-12 EL revenue
R (4,0)	2011-12 Sparsity revenue (ALL)
R (5,0)	2011-12 Equity revenue
R (6,0)	2011-12 Transition revenue
R (7,0)	2011-12 Referendum revenue

R (8,0)	2011-12 Total general education revenue

[*Note.* Variable names are written as (y, x)].

The variables listed above were considered to be the categorical aids that make up the general education formula. These categorical aids were determined by the demographics of each school district. The demographic data was used to calculate the revenue through predetermined formulas for individual school districts. Included in definition of the demographic data was the property value of the school district, the geographic location of the school district, the total number of students or the weighted average daily membership (WADM), the ethnicity of the student population, and the socio-economic status of the school district.

Research Methodology

As previously noted, this study was a replication and extension of Larson's (2014) study. The research methods were identical to Larson's study. According to Larson (2014, p. 68):

> There have been four previous equity studies conducted on the Minnesota funding formula: Carruth (1980), Wilson (1984), Jacobson (1986), Vandal (1997). To maintain consistency and provide longitudinal data, this research parallels those studies in research design.
>
> This study used the recommendations of Berne & Stiefel (1984) for the basis of the statistical devices used to analyze the Minnesota funding formula. Berne & Stiefel (1984) established the rationale for the use of the variance, permissible variance, coefficient of variation, and Gini coefficient in the study of school equity.

The Gini coefficient is a measure of statistical dispersion intended to represent the income or wealth distribution of a nation's residents and is the most commonly used measurement of inequality.

The dependent variable for the research was fiscal equality. The independent variables for this study are identified as the categorical aids that make up the general education formula. The aids are: basic revenue, extended time revenue, gifted and talented revenue, declining enrollment revenue, local optional revenue, small schools revenue, basic skills revenue, secondary sparsity revenue, elementary sparsity revenue, transportation sparsity revenue, total operating capital revenue, equity revenue, pension adjustment revenue, and transition revenue. Larson (2014) identified that fiscal equality takes place when revenues were available for each specific source of revenue and that these revenues were not a function of the school district wealth, but rather a function of the wealth of the state as a whole (wealth neutrality) (p. 69).

Fiscal Equity Measures

The fiscal equity measures for this study were identical to those of Larson's (2014) study in order to maintain the ability to replicate and extend the study. According to Larson (2014, pp. 69-71):

> Three different measures of fiscal equity were used to analyze the equity of the Minnesota funding formula. The statistical tools used were the variance, permissible variance, and coefficient of variation. The statistical measures were consistent with the [Larson (2014)] study. The measures are described as follows:
>
> Variance: The variance was the average of the squared deviations of each per-pupil object from the mean per-pupil object; the smaller the variance, the smaller the variation in the distribution of a given variable (revenue). The variance was used to analyze the degree to which there is dispersion around the mean and can be explained as the smaller the variance, the greater the equity of the particular variable (revenue). The formula for computing the variance was as follows:
>
> $$\sum_{i=1}^{N} Pi(Xp - Xi)^2 \,/\, \sum_{i=1}^{N} Pi$$

Where Pi = the number of pupils in district i

N = the number of districts

Xi = the average revenues per pupil in district i

Xp = the mean revenues per pupil for all pupils

Permissible Variance: The permissible variance was the ratio of the actual sum of per-pupil objects for pupils below the median to the sum of the per-pupil objects that would exist if each pupil below the median were at the median per-pupil object. In other words, "permissible variance shows to what extent the funding formula succeeds in 'leveling up' the bottom half to the middle (Baker, 2013, p. 9). The permissible variance was also known as the McLoone index, and can be computed as follows:

$\sum_{i=1}^{J} P, Xi \,/\, Mp \sum_{i=1}^{J} Pi$ where districts i through J are below Mp

Where Pi = the number of pupils in district i

N = the number of districts

Xi = the average revenues per pupil in district i

Mp = the median revenues per pupil for all pupils

The permissible variance [was] expressed as a decimal with a value between zero and one. The closer the decimal approaches one, the closer the object is to equity. The number can also be used to determine the revenue needed to bring the weighted pupil units up to the median level.

Coefficient of Variation: The coefficient of variation was the square root of the variance of per-pupil objects divided by the mean per-pupil objects. The coefficient of variation [was] typically between zero to one. Similar to the variance, a smaller coefficient of variation indicates a smaller distribution between the objects, thus showing

greater equity. The coefficient of variation [was] used to show the overall disparity in revenues across school districts, and [was] computed as follows:

$$\sqrt{VAR} / Xp$$

Where VAR = variance, and Xp = the mean revenues per pupil for all pupils

Wealth Neutrality Measures

The wealth neutrality measures for this study were identical to those of Larson's (2014) study in order to maintain the ability to replicate and extend the study. According to Larson (2014, pp. 71-72):

> The measure of wealth neutrality that was used is the Gini Coefficient, also known as the Gini Index. This tool examines the dispersion of two different variables, in this case, the distribution of per-pupil revenues and the wealth measure of per-pupil property valuations. The process begins by ranking all school districts from the lowest to the highest based on the per-pupil property wealth. This value [was] shown by the adjusted net tax capacity (ANTC).
>
> Once the districts have been ranked, the Gini Coefficient involves the calculation of a cumulative percentage distribution of per-pupil funding, which again ranks from the poorest to richest districts. Results [were] shown as values from zero to one with a value of one showing absolute equity. The Gini Coefficient [was] calculated with the formula:

$$\sum_{i=1}^{N} \quad \sum_{j=1}^{N} Pi P_J \, |Xi - Xj| \, / \, (2(\sum_{i=1}^{N} Pi)^2 Xp)$$

Where *Pi* = the number of pupils in district i

N = the number of districts

Xi = the average revenues per pupil in district i

Xp = the mean revenues per pupil for all pupils

Figure [1], originally created by Carruth [in 1980], represents a visual road map of both the fiscal equity and wealth neutrality measures (Vandal, 1997). The figure shows the importance of how the statistical measures findings can be directly traced back to a social issue that has been used in regard to fiscal equity in legal cases against the state's funding of k-12 public education.

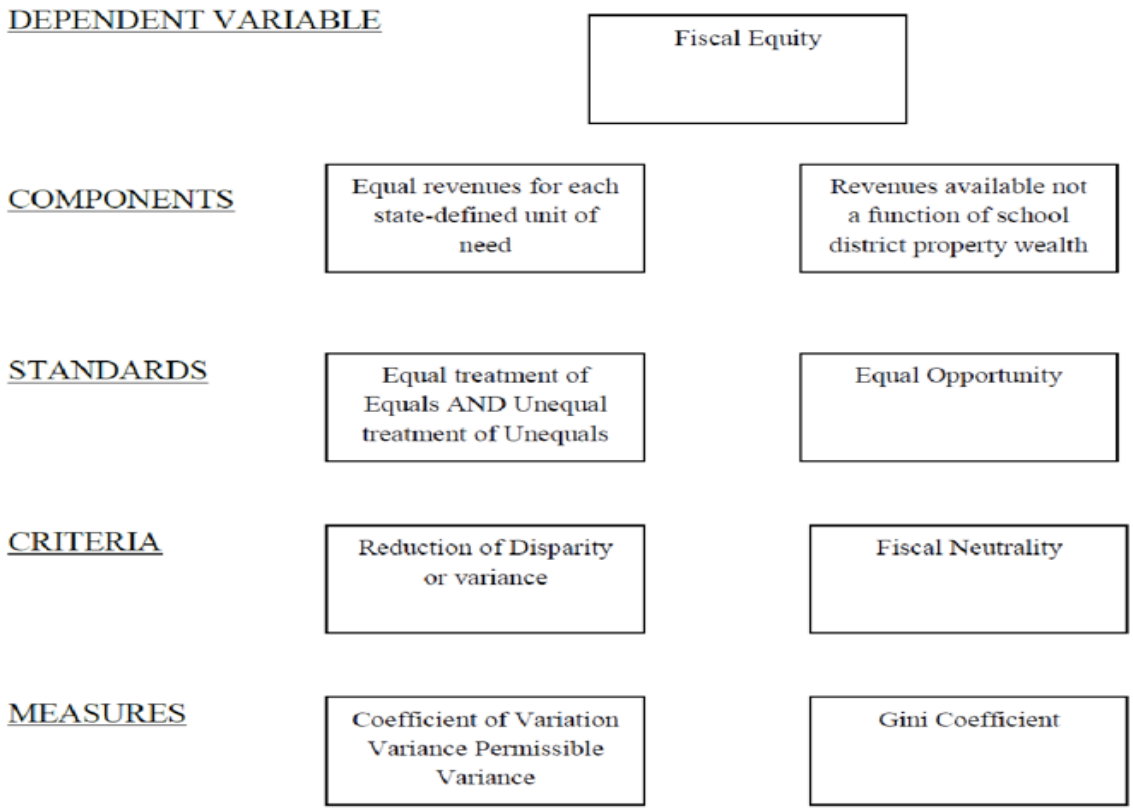


Figure 1. Framework for Equity Evaluation: From "A Longitudinal Fiscal Neutrality Analysis of the Minnesota K-12 Public School Funding Formula," by J. Larson, 2012, p. 72. Open access granted by the Theses, Dissertations, and Senior Projects and UND Scholarly Commons.

In Table 4, the dependent variable was fiscal equity and the components were defined as the categorical aids such as basic revenue, extended time revenue, gifted and talented revenue, declining enrollment revenue, local optional revenue, small schools revenue, basic skills revenue, secondary sparsity revenue, elementary sparsity revenue, transportation sparsity

revenue, total operating capital revenue, equity revenue, pension adjustment revenue, and transition revenue. Many of the categorical aids that make up the total general fund revenue were not based on property wealth. The criteria of why the categorical aids were created were to reduce disparity and create a formula that generated fiscal neutrality. The results of the study produced results that yielded some sort of a variance through the use of the Gini coefficient.

Research Hypotheses and Procedures

For a comparative analysis with previous equity studies, the hypothesis that on a statewide basis revenue was not distributed equitably as measured through a statistical analysis of seven research questions except with the basic general formula revenue. The seven questions from Larson's (2014) study were as follows, and updated to reflect this study's timeframe (p. 72):

1. On a statewide basis, an equitable distribution on the basic general formula revenue will be observed from fiscal year 2012 and fiscal year 2018.
2. On a statewide basis, equitable distribution of the basic skills (compensatory and EL) revenue will not be observed from fiscal year 2012 and fiscal year 2018.
3. On a statewide basis, an equitable distribution on the sparsity revenue will not be observed from fiscal year 2012 and fiscal year 2018.
4. On a statewide basis, an equitable distribution on the equity revenue will not be observed from fiscal year 2012 and fiscal year 2018.
5. On a statewide basis, an equitable distribution on the transition revenue will not be observed from fiscal year 2012 and fiscal year 2018.
6. On a statewide basis, an equitable distribution on the referendum revenue will not be observed from fiscal year 2012 and fiscal year 2018. (This is no longer a general education revenue source).

7. On a statewide basis, the wealth neutrality of the total general revenue distribution will not be observable from fiscal year 2012 and fiscal year 2018.

Summary

In accordance with Larson's (2014) study, "The research was conducted with statistical measures based on fiscal equity and wealth neutrality. Only the public schools that were identified through the Minnesota Department of Education as type 1 schools [were] analyzed based on the hypothesis explained above" (p. 73). The research conducted was from the fiscal years 2012 to 2018 and detailed the current inequity of the general education funding formula in the fiscal year 2017-2018. In the study of categorical aids that make up the general education formula, the Gini coefficient was used to produce a variance. Larson (2014) defined variance as the average of the squared deviations of each per-pupil object from the mean per-pupil object and the smaller the variance, the greater the equity of the particular variable or revenue (p. 69). This variance was used to determine whether or not the legislative changes that were made to the general education formula from fiscal year 2012 to fiscal year 2018 helped to create a financial program that distributed revenues more equitably to the 331 public schools in the state of Minnesota and provided the findings of the research in chapter four. Expected findings were that inequities persist because changes that occur within the general education formula do not keep pace with changing demographics. Chapter 5 will provide recommendations from the researcher.

Chapter 4: Research Findings

The purpose of the study was to do a statistical analysis of the Minnesota general education formula that measured trend data to identify if the general education formula met the criteria of fiscal equity and wealth neutrality. The study focused on and built upon the longitudinal research from previous equity studies done in the state of Minnesota. This study was similar to Larson's (2014) study and used the same measures of fiscal equity and wealth neutrality, and included all public schools in the state of Minnesota. The statistical measures of this study were applied to fiscal years 2012 and 2018. Variance, permissible variance, and coefficient of variation were the three different measures of fiscal equity used to study the equity of the general education funding formula. The following questions from Larson's (2014) study were addressed as part of the statistical analysis:

1. What were the fiscal equity and wealth neutrality characteristics of Minnesota's school districts based on the analysis of the general education formula trend data?
2. What trends can be observed for Minnesota's school district from an examination of the like data elements from the five major studies of fiscal equity and wealth neutrality in Minnesota?
3. What trends can be observed from a comparison of previous studies recommendations and findings and any effect on funding formula equity?

Variance

Larson (2014) defined *variance* as "the average of the squared deviation of each per-pupil object from the mean per-pupil object. The smaller the variance, the smaller the variation in the distribution of a specific variable" (p. 75). In this case, the variable would be considered to be revenue. In this and in past studies, as Larson noted, "the variance is used to determine the

degree to which there is dispersion around the mean. As a result, the smaller the variance, the greater the equity of a specific variable" (p. 75). Again, in the study that variable was revenue.

Permissible Variance

Larson (2014) defined *permissible variance* as "the ratio of the actual sum of per-pupil objects for pupils below the median to the sum of the per-pupil objects that would exist if each pupil were at the median per-pupil object" (p. 75). The permissible variance is expressed as a decimal with a value between zero and one. With permissible variance, Larson pointed out "the closer the decimal gets to one, the closer the subject is to have achieved equity" (p. 75). The identified number could also be used to calculate the increase of the revenue needed to bring the weighted pupil units up to the medial threshold.

Coefficient of Variation

Larson (2014) defined the *coefficient of variation* as "the square root of the variance of per-pupil objects divided by the mean per-pupil objects. The coefficient of variation is typically between zero and one" (p. 75). Similar to variance, the smaller coefficient of variation displays greater equity between objects showing greater equity. Larson further clarified, "This calculation is used to show the overall disparities in revenues across the school districts" (p. 75).

Hypothesis and Research Questions

The sections below detail the findings for the hypothesis that on a statewide basis revenue was not distributed equitably across the state of Minnesota with the exception of the basic general formula revenue. The hypothesis was measured through a statistical analysis of seven research questions that were tied to the general education formula. This study analyzed the same categorical aids of the general education formula that Larson's (2014) study reviewed. They were as follows: basic revenue, compensatory revenue (basic skills revenue), English learner revenue (basic skills revenue), sparsity revenue, equity revenue, transition revenue, and

referendum revenue. The seven questions from Larson's (2014) study were as follows, and updated to include this study's date range (p. 72):

1. On a statewide basis, an equitable distribution of the basic general formula revenue will be observed from fiscal year 2012 and fiscal year 2018 showing fiscal equity.
2. On a statewide basis, equitable distribution of the basic skills (compensatory and LEP) revenue will not be observed from fiscal year 2012 and fiscal year 2018.
3. On a statewide basis, an equitable distribution of the sparsity revenue will not be observed from fiscal year 2012 and fiscal year 2018.
4. On a statewide basis, an equitable distribution on the equity revenue will not be observed from fiscal year 2012 and fiscal year 2018.
5. On a statewide basis, an equitable distribution on the transition revenue will not be observed from fiscal year 2012 and fiscal year 2018.
6. On a statewide basis, an equitable distribution on the referendum revenue will not be observed from fiscal year 2012 and fiscal year 2018. (This is no longer a general education revenue source).
7. On a statewide basis, the wealth neutrality of the total general revenue distribution will not be observable from fiscal year 2012 and fiscal year 2018.

Basic Education Formula Revenue

School districts receive a majority of their general operating funds from the state through the general education revenue program. Statewide, approximately two-thirds of total school district revenue comes from the general education program and is distributed to local school districts through state aid payments. Strom (2018) estimated for the fiscal year 2019 that the state of Minnesota will be distributing over $6,020,200,000 to 330 school districts through the basic

formula allowance (p. 17). The basic revenue for each school district is calculated by multiplying the adjusted pupil units by the formula allowance. Strom (2018) stated that the formula allowance for the fiscal year 2019 and later has been set at $6,312. Table 4 details the total revenue for each General Education Revenue component, and the number of eligible districts, and Table 5 details the basic formula allowances for each year as reported by Storm (2018, p. 18).

Table 4: General Education Revenue Components

General Education Revenue Component	All Revenue	Eligible Districts
Basic Formula Allowance	**$6,020,243,000**	**330/331**
Extended Time Revenue	$60,571,000	141/331
Gifted and Talented	$12,399,000	330/331
Small Schools Revenue	$16,560,000	159/331
Declining Enrollment Revenue	$10,265,000	177/331
Local Optional Revenue	$370,817,000	314/331
Basic Skills (Compensatory & EL) Revenue	**$619,388,000**	**329/331**
Sparsity Revenue (Elem & Sec)	**$28,340,000**	**105/331**
Operating Capital Revenue	$215,916,000	330/331
Transportation Sparsity Revenue	$71,775,000	306/331
Equity Revenue	**$112,447,000**	**330/331**
Transition Revenue	**$30,173,000**	**200/331**
Pension Adjustment Revenue	$19,286,000	331/331
Options Adjustments	$7,957,000	122/331
Total General Education Revenue	$7,596,137,000	

Note. The emboldened components were included in this study.

Table 5: Basic Education Formula Allowance

School Year	Formula Allowance
2018-19	$6312
2017-18	$6188
2016-17	$6067
2015-16	$5948
2014-15	$5831
2013-14	$5302

Larson (2014) stated, "the most equitable revenue source was the basic revenue formula" (p. 89). This is true, as this basic education formula revenue is distributed to each local school district based on the local district's adjusted pupil units. This type of payment satisfied the definition of true horizontal equity. Leuken and Shuls (2019) defined horizontal equity as "funding for students as being the same" (p. 7). As a result, there are no other student demographics taken into account such as individual differences, demographics, and location. Horizontal equity can be thought of as "equal treatment of equals" (Leuken and Shuls, 2019, p. 7).

According to Larson (2014), "The basic general education revenue establishes the minimum level of funding for local school districts" (p. 76). The first research question tested was that on a statewide basis there was an equitable distribution of the general education formula between the fiscal years 2012 and 2018. Larson (2014) further stated that the basic general education is a payment that is distributed to all school districts and believed to be the most equitable revenue source, and in the areas of permissible variance and coefficient of variation, the basic general education revenue archives almost perfect equity (p. 76). Table 6 represents the

statistical results display resulting in an equitable distribution of revenue through the general education formula as the variance yielded results at or near a score of one. The basic education formula for this statistical analysis was also proven to be equitable on a statewide basis. The basic permissible variance was near a score 1.0 for both fiscal years while there was not significant variation between the two fiscal years observed. The research question that basic education revenue was distributed equitably on a statewide basis was accepted.

Table 6: Fiscal Equity Analysis of Basic General Revenue

	Basic		
Fiscal Year	Variance	Permissible Variance	Coefficient of Variation
2012	4414.14	1.0479	0.0111
2018	1303.22	0.9995	0.0053

Basic Skills: Compensatory Revenue

Compensatory revenue is a revenue source that is based on the local school district's number and concentration of students who qualify for free and reduced priced lunches. This type of revenue is an example of vertical equity. Strom (2018) stated that compensatory revenue averages about $624 per pupil for those students who qualify for compensatory revenue. Leuken and Shuls (2019) suggested that students with different needs should be funded at different levels (p. 7). English Learner revenue is calculated by identifying the number of students who are English Language Learners.

Strom (2018) defined compensatory revenue as site-based revenue and is calculated based on the characteristics of each school site. Fifty percent of the revenue must be distributed to qualifying programs at each school site (p. 20). Compensatory revenue is used to support students that have not progressed toward meeting state and local performance standards.

Compensatory revenue must be kept in a separate account and each district has to create an annual report that details how the compensatory revenue was spent at each site. As Strom, (2018) explained, the compensatory revenue increases as more students who qualify are identified through the free and reduced meal applications. (p. 20) As a result, as the concentration of students eligible for free and reduced meals increased, so does the revenue per pupil.

Compensatory revenue is a part of the basic skills revenue, along with English Learner revenue, which had previously been Limited English Proficiency revenue. This study sought to prove that on a statewide basis compensatory revenue was not distributed in an equitable manner between the fiscal year 2012 and fiscal year 2018. The results, as shown in Table 7, determined that on a statistical basis, compensatory revenue was not equitable. As stated earlier, the permissible variance needed to be near 1.0 to reach equity and the numbers moved further from 1.0. The coefficient of variation showed results that did not support the equitable distribution of funds. Based on the statistical analysis of compensatory revenue, the research question that the revenue was not distributed equitably was accepted by the researcher.

The statistical results of this researcher's study showed that both categorical aids were distributed in an inequitable fashion on a statewide basis. The analysis resulted in data that showed a decline in how the revenue was distributed on statewide basis as the permissible variance moved further away from the variable of one for the compensatory revenue. The English Learner revenue declined in permissible variance as well; however, that result was closer to one than compensatory revenue. The research question found that both the compensatory and English Learner revenue were not distributed equitably and therefore the question was accepted.

Table 7: Fiscal Equity Analysis of Basic Skills-Compensatory Revenue

	Compensatory		
Fiscal Year	Variance	Permissible Variance	Coefficient of Variation
2012	222210.7411	0.4096	0.9551
2018	289640.8360	0.3509	0.9887

Basic Skills: English Learner Revenue

> According to Strom (2018), English Learner (EL) revenue was created to provide instruction to students with limited English skills. Programs may include bilingual programs or English-as-a-second-language (ESL) programs. Bilingual education programs provide curriculum instruction to students in their native language. ESL program students are taught to read, write, listen, and speak English. The state has provided funding for EL programs since 1980. In the early 2000s, the maximum number of years that a student could qualify for EL funding was reduced from seven to five years…and restored to seven years for fiscal year 2017 and later. (p. 22)

Strom (2018) also explained there are two parts included in the EL formula: basic EL and a concentration part of the formula. (p.22) The basic EL formula has assigned a flat dollar amount of $704 per student. The concentration portion of the formula utilized a measure of the concentration of pupils multiplied by $250.

In Table 8, the EL statistical findings show that the permissible variance in the Fiscal year 2012 was 1.5815 and 0.2412 in the fiscal year 2018. Since it fell below the level of 0.5 it has been identified that the revenue was distributed in an inequitable manner on a statewide scale. The coefficient of variation had a small range between the fiscal year 2012 and fiscal year 2018. Again, this difference in value displayed the difference in how the revenue was distributed statewide. As a result, these statistical findings lead to a determination that an inequitable

distribution of revenue exists statewide, and the research question that the English Learner Revenue was not distributed in an equitable manner was accepted.

The statistical results of this researcher's study showed that both categorical aids were distributed in an inequitable fashion on a statewide basis. The analysis resulted in data that showed a decline in how the revenue was distributed on statewide basis as the permissible variance moved further away from the variable of one for the compensatory revenue. The English Learner revenue declined in permissible variance as well; however, that result was closer to one than compensatory revenue. The research question found that both the compensatory and English Learner revenue were not distributed equitably and therefore the question was accepted.

Table 8: Fiscal Equity Analysis of Basic Skills-English Learner Revenue

	English Language		
Fiscal Year	Variance	Permissible Variance	Coefficient of Variation
2012	3268.1415	1.5815	2.5789
2018	5054.5566	0.2412	2.4681

Training and Experience Revenue

Training and Experience revenue was a revenue stream that was distributed to local school districts based on the experience and education that each educator had within the school district. In fiscal year 2012, training and experience revenue was repealed and no longer available to local school districts in Minnesota. As a result of the repeal, there were no data to review and this revenue source will not be a part of this statistical analysis as it was in Larson's (2014) study.

Sparsity Revenue

Strom (2018) defined sparsity revenue as additional revenue provided to school districts that are considered to be large geographically and have relatively few pupils (p. 23). Strom (2018) continued to explain that sparsity revenue measures the isolation of the local school district and as a result, provides revenue to local school districts based on an assumption of how many pupil units it would take to run a secondary educational program. Local school districts with small enrollments but large in size geographically have received the largest share of this revenue and ensured that these types of school districts received funding due to the isolation and not because of the local school boards' resistance to shared or cooperative programming. Strom (2018) estimated that 105 of the 331 school districts in Minnesota qualify for sparsity revenue at a cost of $28,340,000 to the state of Minnesota (p. 17).

Sparsity revenue is another example of vertical equity revenue and was created to provide support to local school districts who are considered isolated and might have experienced declining enrollment. The decline in enrollment also leads to a smaller basic revenue payment as the local school district's weighted average daily membership declines, but often doesn't lead to a decline in operating expenses. For example, a district may require students to complete a math class to graduate. The school district must offer and staff that class whether there are seven students or 20 students in the class. If enrollment declines, revenue declines, but the school district cannot reduce expenses beyond a certain point and still carry out the educational programming of the school district. The research suggests that the sparsity revenue was not distributed on an equitable basis statewide.

Table 9 represents the statistical findings of sparsity revenue. As stated earlier, not all local school districts received sparsity revenue and because of this the median revenue for the fiscal year 2012 and 2018 could not be computed. As a result, the permissible variance for

sparsity revenue could not be calculated and is displayed in table 9. The coefficient of variation ranged from 1.3339 in the fiscal year 2012 to 1.2084 in the fiscal year 2018. In theory, to reach perfect equity for the coefficient of variation would be to have the number that approached zero. The statistical findings in the area of sparsity revenue showed an inequitable disbursement of sparsity revenue on a statewide level but did display statistical improvement. The research question that on a statewide basis, sparsity revenue was not distributed equitably. As a result, the research question yielded results that validated that the sparsity revenue was not distributed in an equitable manner based on the statistical findings of the sparsity revenue.

Table 9: Fiscal Equity Analysis of Sparsity Revenue

	Sparsity		
Fiscal Year	Variance	Permissible Variance	Coefficient of Variation
2012	53783.9195	#DIV/0!	1.3339
2018	66771.5166	#DIV/0!	1.2084

Note. #DIV/0! - Could not be collected due to median = 0

Equity Revenue

Larson (2014) defined equity revenue as revenue that was intended to reduce the pupil disparities between local school districts (p. 81). Strom (2018) stated that equity revenue is made up of four parts: basic equity revenue; a metro and nonmetro area adjustment; low referendum equity revenue; and a supplemental formula (p. 26). Strom (2018) identified that 330 out of the 331 local school districts qualify for equity revenue and the state spends $112,447,000 on this categorical revenue (p. 17).

Strom (2018) defined equity as being made up of four parts: basic equity revenue, a metro and nonmetro adjustment, low referendum equity revenue, and a supplemental equity

formula (p. 26). For the purpose of calculating equity revenue, Minnesota is divided into two regions: a "metro" region that includes the seven county metro area, and a "rural" region that includes the rest of greater Minnesota. Equity revenue is calculated separately for districts within each region, based on the difference between the sum of the basic formula allowance, local optional revenue, and referendum revenue per pupil unit and the amounts for the district at the 95th percentile in the region in which it is located.

The research question for equity revenue examined that an equitable distribution will not be observed for the fiscal years 2012 and 2018. Table 10 displays the statistical findings for equitable distribution of the equity revenue. The permissible variance for the fiscal year 2012 was 0.7495 and increased 0.7689 in the fiscal year 2018. Again, to have gained perfect equity the score needed to have a score of 1.0. Although the statistical analysis of permissible variance showed the scores moving closer to 1.0 and appeared to be making progress, on the coefficient of variation, the statistical findings showed improvement in the fiscal year 2012 and in the fiscal year 2018. Equity revenue was not distributed equitably on a statewide basis for the years that were reviewed. Equity revenue had a permissible variance of 0.7495 in fiscal year 2012 and a score of 0.7689 in fiscal year 2018. The coefficient of variance resulted in a decrease from 0.2895 to 0.2856. Although the variation was small, there was a trend that showed a decrease in the results. The research question was accepted that equity revenue was not distributed on an equitable basis. However, due to the findings, the research question was accepted.

Table 10: Fiscal Equity Analysis of Equity Revenue

	Equity		
Fiscal Year	Variance	Permissible Variance	Coefficient of Variation
2012	1260.4211	0.7495	0.2895

2018	1717.9915	0.7689	0.2856

Transition Revenue

Strom (2018) identified that the state of Minnesota spends $30,173,000 with 200 of the 331 local school districts having qualified for this revenue (p. 17). Transition revenue is intended to provide school districts with a hold harmless provision due to legislative changes that took place in 2003. Strom (2018) detailed that transition revenue provided school districts with hold harmless due to the legislative changes made to the general education formula in 2003 (p. 27). Transition revenue guaranteed that local school districts received funding that equaled the amount the local school district would have received prior to 2003. Fiscal year 2004 was the first year that the local school districts were eligible for this revenue. According to Strom (2018),

> This revenue source guarantees the school district the lessor of (a) its fiscal year 2003 general education revenue or (b) the amount of revenue per pupil that the district would have received during the 2004 fiscal year under the old definitions of general education revenue. In fiscal year 2015, transition revenue is adjusted for a number of changes to the general education revenue program. (p. 27)

The research question for transition revenue was that on a statewide basis, an equitable distribution of the transition revenue would not be observed in the fiscal years of 2012 and 2018. Transition revenue displayed an inequitable distribution on a statewide basis. The permissible variance in fiscal year 2012 had a score of 0.1307 and a score of 0.1197 in fiscal year 2018. The coefficient of variation had scores that ranges from 3.8546 in fiscal year 2012 to 3.5660 in fiscal year 2018. The scores displayed a downward trend for equitable distribution. Again, the ideal value for the coefficient of variation should be identified at 0.0. The high values identified in the

coefficient of variation displayed a variation across the state and as a result, the null hypothesis was accepted.

Table 11: Fiscal Equity Analysis of Transition Revenue

	Transition		
Fiscal Year	Variance	Permissible Variance	Coefficient of Variation
2012	4724.4115	0.1307	3.8546
2018	4589.9358	0.1197	3.5660

Referendum Revenue

Strom (2018) defined the referendum program as being often referred to as the operating referendum levy or the excess levy referendum, [and] is a mechanism that allows local school districts to obtain voter approval in order to generate an increase in revenue beyond the limits set in statute. Because of the exceptional growth in the referendum levy in the late 1980s and early 1990s, the legislature made several changes to the program. (p. 32)

Larson (2014) stated that

> referendum revenue is an equalized revenue source based on a school district's local referendum levy. [For fiscal year 2012,] the first $700 per pupil of a school district's referendum levy is equalized at $476,000 per pupil of referendum market value. Any amount over $700 is equalized at $270,000 per pupil of referendum capped at $1,576.35 per pupil for the fiscal year 2012. A school district only received referendum funding if it passes a voter-approved referendum levy. 301 school districts had a local referendum levy during the fiscal year 2012. (p. 84)

The 2013 Legislature made several significant changes that went into effect in fiscal year 2015. The Legislature changed how students were counted by shifting from revenue being based

on the number of resident pupil units to the number of students served in the district, or adjusted pupil units. In addition, school districts were allowed to shift the first $300 per pupil of an existing referendum authority by board action so that it would not have to be renewed by the district's voters, or create a $300 board approved referendum authority if the district did not already have one in place. Finally, a new revenue was created, called local optional revenue that allowed school boards to convert referendum authority to local optional revenue, or increase their authority if they did not previously have an operating referendum. In addition to these changes, the state also increased the equalization of the first tier, resulting in the payment of additional equalization aid to districts and a reduction in property tax levies.

According to Strom (2018, p. 33), for fiscal year 2019, the first $300 per pupil of a school district's referendum levy is equalized at $880,000 per pupil of referendum market value. Between $300 per pupil and $760, the levy is equalized at $510,000 per pupil of referendum market value. Any amount over $760 (up to 25% of the basic formula allowance unless the district qualifies for sparsity revenue) is equalized at $290,000 per pupil of referendum. Total referendum revenue is capped at $1,963 per pupil for the fiscal year 2019. For fiscal year 2019, a school district could receive referendum funding if the local voters approve a voter-approved referendum levy, or the local school board could approve an amount up to $300 per pupil.

The research question of referendum revenue is that on a statewide basis an equitable distribution will not be observed in the fiscal years 2012 and 2018. The statistical analysis can be identified in Table 12. The referendum findings for both the permissible variance and the coefficient of variation show a decrease in the equitable distribution of referendum revenue statewide for the fiscal years 2012 and 2018. Perfect equity occurs with scores approaching 1.0 for permissible variance and approaching 0.0 for the coefficient of variance. This shows that the

state needs to continue to make progress toward fiscal equity and that more work is needed to achieve the equitable distribution of referendum revenue. Based on the statistical analysis the research question was accepted.

Table 12: Fiscal Equity Analysis of Referendum Revenue

	Referendum		
Fiscal Year	Variance	Permissible Variance	Coefficient of Variation
FY12	346356.5572	0.6084	0.6477
FY18	325767.2978	0.4429	0.6833

Wealth Neutrality Analysis

The wealth neutrality was studied through the review of the total general education funding in the state of Minnesota. The Gini Coefficient, sometimes referred to as the Gini Index, was the tool selected to measure wealth neutrality. The values are calculated using the distribution of per pupil revenues and the distribution of the wealth measure of the per pupil property valuations. In order to prove equity of wealth neutrality, the values must be displayed between zero and one. A wealth neutrality score or value that is at or greater than zero displayed inequity.

For fiscal year 2012 and 2018, the state made gains in wealth neutrality. For fiscal year 2012 the score that was produced equaled 0.00460 and for fiscal year 2018 the score was 0.00431. In order to prove true wealth neutrality, the Gini Coefficient score needed to be at or near zero. Although the fiscal years studied produced a decreasing score between the fiscal year 2012 and 2018 that moved the values closer to zero and resulted in the research question being accepted.

Historical Review of Minnesota Fiscal Studies

In the past, there have been five equity studies that have been completed on how the state of Minnesota funds K-12 public schools. In 2014, Larson completed the last equity study using fiscal year 2012, while Carruth (1980) completed the first study using fiscal year 1980. Since that time there have been three others that have completed in between Larson and Carruth. Wilson (1984) used fiscal year 1984, Jacobson (1986) used fiscal year 1986, and Vandal (1997) used fiscal year 1997. This section reviewed the statistical findings of like data over that time and utilized findings that were representative of the previous statistical studies.

Basic General Revenue

Larson (2014) was the only one of the previous researchers made the choice to include the basic general revenue in their statistical analysis. This researcher compared their results to Larson's (2014) results as shown in Table 13. The state has shown relative consistency between Larson's (2014) study and the current researcher. The permissible variance was extremely close to perfect equity as the result neared the score of one. The coefficient of variation also showed progress as that score moved closer to zero. On a statewide basis, the basic general revenue has displayed an equitable distribution from 2012 to 2018.

Table 13: Historical Comparison of Equitable Distribution of Basic General Revenue

Researcher	Variance	Permissible Variance	Coefficient of Variation
Larson (2014)	4446.438	0.9907	0.0111
Lunak (2020)	1303.221	0.9995	0.0053

Sparsity Revenue

Sparsity revenue was a common revenue stream that was studied by all six researchers as shown in Table 14. Similar to Larson's (2014, p. 94) explanation, overall, the results were

statistically similar to the disbursement of the revenue over the course of the years that were studied. The variance has increased over time as the revenue has increased in this area. The coefficient of variation has increased over the years that display an improved equity distribution in sparsity revenue. This revenue is intended to provide additional revenue to large geographic districts that have few secondary students. This revenue stream helps to provide support through vertical equity.

Table 14: Historical Comparison of Equitable Distribution of Sparsity Revenue

Researcher	Variance	Permissible Variance	Coefficient of Variation
Carruth			
Wilson	3182.000		.6100
Jacobson	750.745	-0.0110	2.6800
Vandal	2351.730	-	7.76687
Larson	52754.334	-	1.3050
Lunak	66771.517	-	1.2804

Note. The dash (-) denotes the Permissible Variance could be calculated as the state had a median score of zero. Adapted from "A Longitudinal Fiscal Neutrality Analysis of the Minnesota K-12 Public School Funding Formula," by J. Larson, 2012, p. 94. Open access granted by the Theses, Dissertations, and Senior Projects and UND Scholarly Commons.

Compensatory revenue was another revenue source that was studied by all six researchers. This revenue source came to the local school districts through their free and reduced lunch census. Compensatory revenue falls under the umbrella of basic skills revenue. Although basic skills revenue also included English Learner revenue, compensatory was separated out for historical comparison purposes and those values are found on Table 15. The statistical analysis of compensatory revenue has historically produced similar results to the other revenue streams that were studied. Larson (2014) stated that the "permissible variance between his study and

Vandal's study (1997) were statistically equal" (p. 96). Compensatory revenue was seen as a vertical equity resource and has continued to provide additional resources for those students that live in poverty and require additional resources to educate.

Table 15: Historical Comparison of Equitable Distribution of Compensatory Revenue

Researcher	Variance	Permissible Variance	Coefficient of Variation
Carruth Wilson Jacobson	3528.000	.6465	1.3700
Vandal	34274.760	0.4731	1.7419
Larson	211753.560	0.4998	0.9278
Lunak	289640.836	0.3509	0.9887

Note. Adapted from "A Longitudinal Fiscal Neutrality Analysis of the Minnesota K-12 Public School Funding Formula," by J. Larson, 2012, p. 96. Open access granted by the Theses, Dissertations, and Senior Projects and UND Scholarly Commons.

Total Combined Revenue

Total combined revenue was the final common data set that was studied for comparison purposes. Table 16 displayed the results of wealth neutrality of the K-12 general education programming based on the Gini Coefficient. Statistically there have not been significant changes since 2003. The goal is to be at or near zero to produce true equity. Although it appears that the state has moved statistically closer to perfect equity, the state has not distributed wealth equitably on a statewide basis.

Table 16: Historical Comparison of Wealth Neutrality Measures

Fiscal Year	Gini Coefficient
2003	.01624
2004	.00980

2005	.00607
2006	.00577
2007	.00622
2008	.00579
2009	.00529
2010	.00670
2011	.00578
2012	.00460
2018	.00431

Note. Data from "A Longitudinal Fiscal Neutrality Analysis of the Minnesota K-12 Public School Funding Formula," by J. Larson, 2012. Open access granted by the Theses, Dissertations, and Senior Projects and UND Scholarly Commons.

Summary of Findings

The state of Minnesota's K-12 public school finance system provides revenue to operate the state's public schools. The majority of this revenue is distributed to school districts through the general education revenue program, which provides revenue to cover the operating costs of the local school districts.

The purpose of this study was to complete a statistical analysis that measured the fiscal equity and wealth neutrality of several revenue sources with the general education revenue program. The fiscal equity of this statistical study was measured through the use of variance, permissible variance, and the coefficient of variation. Wealth neutrality of the total general education formula was measured through the Gini Coefficient.

The following is a summary of the research questions that were studied to determine if revenue was distributed in an equitable manner on a statewide basis:

1. Research question number one was accepted that on a statewide basis, an equitable distribution of the basic general formula revenue was observed from fiscal year 2012 and fiscal year 2018 showing fiscal equity.
2. Research question number two was accepted that on a statewide basis, equitable distribution of the basic skills (compensatory and EL) revenue was not observed from fiscal year 2012 and fiscal year 2018.
3. Research question number three was accepted that on a statewide basis, an equitable distribution of the sparsity revenue was not observed from fiscal year 2012 and fiscal year 2018.
4. Research question number four was accepted that on a statewide basis, an equitable distribution of the equity revenue was not observed from fiscal year 2012 and fiscal year 2018.
5. Research question number five was accepted that on a statewide basis, an equitable distribution of the transition revenue was not observed from fiscal year 2012 and fiscal year 2018.
6. Research question number six was accepted that on a statewide basis, an equitable distribution of the referendum revenue was not observed from fiscal year 2012 and fiscal year 2018. (This is no longer a general education revenue source).
7. Research question number seven was accepted that on a statewide basis, the wealth neutrality of the total general revenue distribution was not observed from fiscal year 2012 and fiscal year 2018.

Based on the statistical results, the basic general education formula revenue was the only revenue source that was discovered to have distributed revenue equitably on a statewide basis.

Research also indicated that the total general revenue was not distributed equitably and did not indicate wealth neutrality. Chapter five details recommendations that will be presented as a result of this statistical study.

Chapter 5: Conclusions and Recommendations

Dupre and Dayton (2006) stated "all 50 states have experienced school funding reform efforts that ranging from a grass roots reform to intense litigation, and some states have experienced protracted serial litigation extending over decades" (p. 28). As a result, litigation has been brought forward against many of the states that argued that the State was not meeting its own constitutional mandates. Gillespie (2010) stated "education finance litigators seek to improve the quality of school districts by increasing the funding" (p. 991). Alexander & Alexander (2019) referenced several such cases. Cases such as *Edgewood Independent School District v. Kirby* in 1989 in Texas found that the state financing system caused wide disparities in revenue among local school districts and violated the "efficient" provision of education clause of the Texas Constitution. *DeRolph v. State* in Ohio in 1997 found that the state system of school funding violated the "thorough and efficient" provision of the Education Clause of the Ohio Constitution. *Rose v. Council for Better Education, Inc.* in Kentucky in 1989 found that the legislature failed the constitutional requirement to establish an efficient system of common schools. *Claremont School District v. Governor* in New Hampshire in 1997 found that the fundamental right of education required adequate financing by the legislature. There has been a great deal of contention over the level of resources needed to provide students with an adequate education and legislators annually debate how much revenue is needed to fund education but also how to distribute those funds. Most of the debate has taken place because, in order to identify that funding level, it was essential to identify what also makes up an adequate education. Hinojosa (2018) referenced that when funds are well spent; improved students' outcomes and performance result, especially for marginalized students (p. 7).

The challenge of each state maintaining an equitable and adequate funding has developed over the course of many years and has been shaped through the actions of three primary sectors: the courts, federal and state governments, and the research communities. The challenge of achieving both an adequate and an equitable education evolved through litigation that included verdicts pertaining to finance and to equity. These verdicts also clarified what should be included in a high-quality education. In general, courts have seemed to favor a high-quality education including knowledge of economic and political systems, an understanding of the governmental process, knowledge of mental and physical health, and training or preparation for training in the academic or vocational fields. However, while litigation clarified what curriculum components should be included in a quality education, it did not define the cost of providing the education. As a result, it has proven to be more difficult for all parties to reach an agreement.

The state of Minnesota's K-12 public school finance system provides revenue to operate the state's public schools. The majority of this revenue is distributed to school districts through the general education revenue program, which provides revenue to cover the operating costs of the local school districts.

The purpose of this study was to complete a statistical analysis that measured the fiscal equity and wealth neutrality of several of the revenue sources within the general education revenue program. The fiscal equity of this statistical study was measured through the use of variance, permissible variance, and the coefficient of variation. Wealth neutrality of the total general education formula was measured through the Gini Coefficient.

Recommendations

Creating a strong, equitable school finance system is a challenging task for our state and federal legislators. Through a statistical analysis of data that involved fiscal years 2012 and 2018, combined with an historical look of past equity studies that spanned more than three decades,

this researcher proposes recommendations to improve Minnesota K-12 funding and recommended ideas for future research studies. The following are recommended in no specific order of importance.

Basic Education Formula

The basic education formula makes up the bulk of the education spending because it is intended to cover all costs associated with providing a basic education. These costs include but are not limited to such factors such as salaries and benefits for personnel costs. The basic formula allowance was set at $6,312 for the 2018-2019 school year. In Minnesota the basic funding formula has not kept pace with inflation. Figure 2 shows that had the funding formula kept pace with inflation since 2003 the formula allowance would be $6,930, or a gap of $618 dollars per pupil, or a loss of 9.8%. A foundational component of creating a strong, equitable and adequate state school finance system is identifying steady and adequate revenue that support both instructional and operational costs, as well as capital costs in the basic education formula needs to be identified in Minnesota.

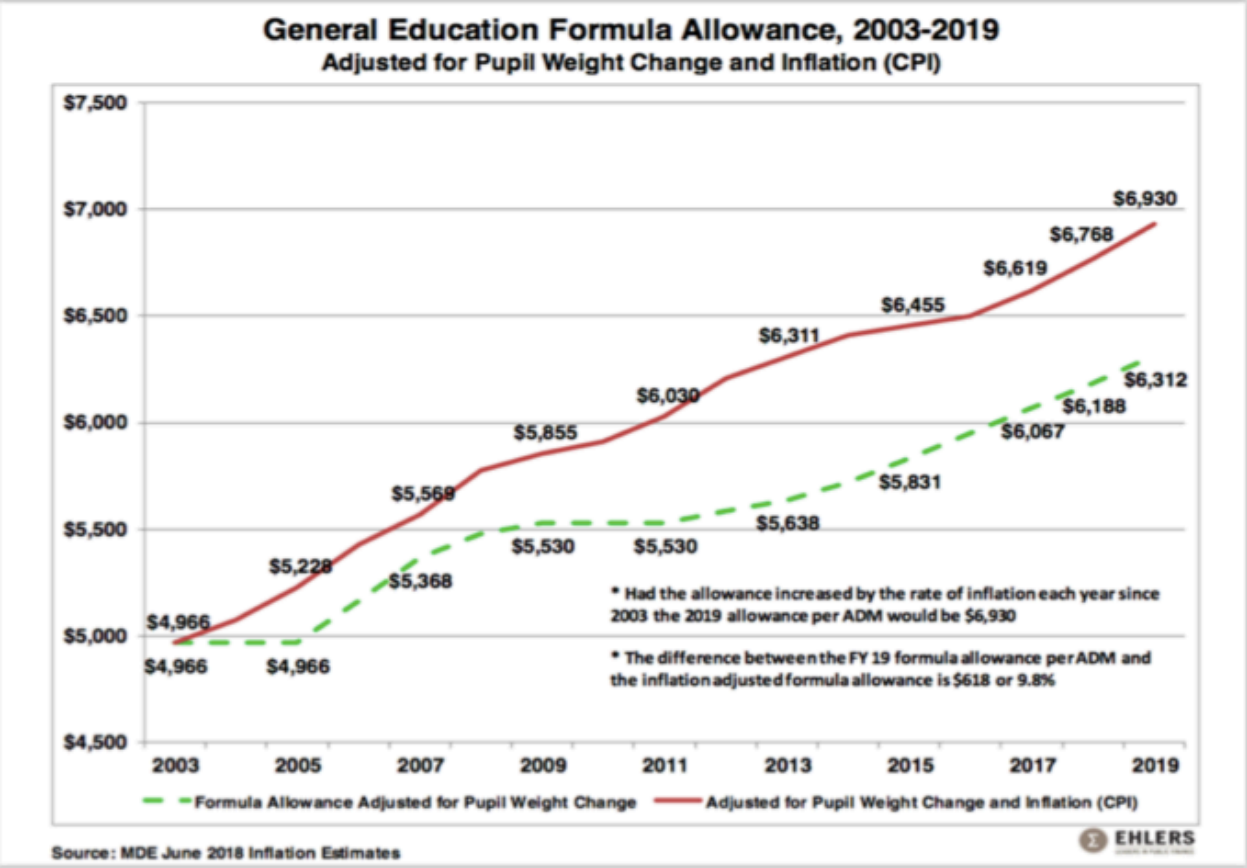
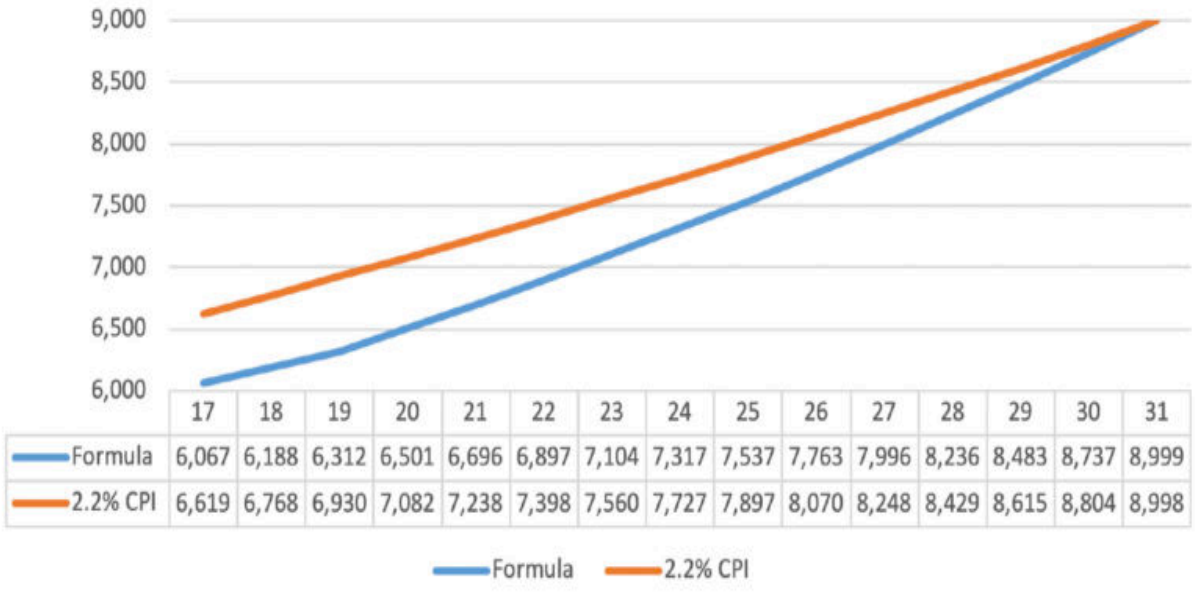


Figure 2: General Eduction Formula Allowance 2003-2019 (EHLERS, 2018). From "AMSD Connections," by the Association of Metropolitan School Districts (Ed.), 2018, September, 15(11), p. 4.

As a result of the per pupil payment falling $618 dollars behind inflation, school districts have become more dependent on local taxpayers, resulting in a greater dependence on referendum revenue. Dehmer (2018) reported that in the 1992-1993 school year that 65% of school districts in Minnesota had an operating levy in place, averaging $332 per pupil. Currently, all school districts in Minnesota have operating referendums that average $1,371 per pupil (p.10).

The researcher also recommended that the basic education formula allotment be tied to an inflation index. Figure 3 illustrates how many years it would take for the general education

formula to match inflation growth with an increase of three percent on the funding formula while the inflation rate was set at 2.2 percent.



	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Formula	6,067	6,188	6,312	6,501	6,696	6,897	7,104	7,317	7,537	7,763	7,996	8,236	8,483	8,737	8,999
2.2% CPI	6,619	6,768	6,930	7,082	7,238	7,398	7,560	7,727	7,897	8,070	8,248	8,429	8,615	8,804	8,998

Figure 3 Annual Formula Increase of 3% and Inflation at 2.2%. (Center for rural policy and development). From "Helping all of Minnesota's students thrive," by T. Holthaus and F. Nolan, n.d., p.1.

Sutter and Seeley (2017) stated that 68 percent of the revenue that is allotted to local school districts comes from the state of Minnesota (p. 10). Since a large majority of the revenue comes from the state through legislative apportionment it is very difficult for local school districts to have stable and consistent revenue sources beyond a two-year legislative apportionment. Ideally school districts would benefit from revenue sources becoming more balanced, resulting in more stable revenue to help local school districts get through challenging times should one revenue source fall short in difficult times. School districts need this revenue to be consistent for long term planning purposes. Figure 4 displays the revenue sources and the cumulative percent paid to school districts.

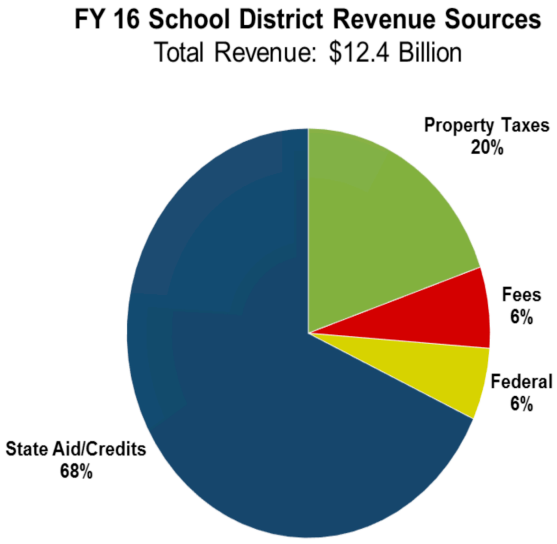


Figure 4 Fiscal Year 2016 School District Revenue Sources. From "A Primer for Best Practices in School Finance," By J. Sutter and J. Seely, 2017, p. 10.

Continuing on the lines of consistent basic funding, the state needs to continue to monitor local optional revenue, currently $724 per pupil, and created via school board action. The legislature helped to reduce confusion with this program, which used be divided into $300 board approved level and a $424 local optional revenue. This was revenue neutral if the local district already had local operating revenue in place. As part of the monitoring, the state needs to continue to adjust the equalization factors to continue to avoid local tax increases.

Special Education Funding

Allotments for students who require special student programming reflect the special educational needs of certain student groups. Research shows that students with these special needs often require additional educational resources to achieve the standards and goals set by states (Individuals with Disabilities Education Improvement Act, 2004). Special education is another area of funding that required attention. Special education expenditure growth over the

last decade has nearly doubled with the federal government picking up only eight percent of $2.2 billion annual cost (Golden, 2019, p. 1).

Strom (2018) stated:

> Local school districts are required by state law to provide an appropriate and necessary special education to children with disabilities from birth to 21 years of age. Children with disabilities are defined in statute to include children who have a hearing impairment, visual disability, speech or language impairment, physical disability, mental disability, emotional/behavior disorder, specific learning disability, deaf/blind disability, or other health impairment. (p. 57).

Categories of disabilities vary from state to state, with some basing the weight on the specific type of disability, others on the instructional arrangement and still others on added support. In Minnesota there is a total of 16.5% of students receiving special education services, or 142,270 students served in 14 different categories (Strom, 2018. p. 57).

School districts across Minnesota receive state aid and some federal aid to cover the costs of special education services. School districts are required to use other general fund revenue to cover the costs of education should there not be enough state and federal special education revenue to cover the costs of special education services. This gap in funding is referred to as the *cross subsidy* (Strom, 2018, p. 58). The cross subsidy reflects funds that are spent on special education services and not used for general education programs. The cross subsidy not only impacts all students, it impacts all public schools regardless of location, student location, or property wealth. Table 17 details the amount of revenue that special education cross subsidy has grown since fiscal year 2013.

Table 17: Special Education Cross Subsidy

Fiscal Year	Funding Gap
2013	$670.3
2014	$681.3
2015	$725.1
2016	$755.7
2017	$734.8
2018	$737.2
2019	$758.8

Note. Funding gap displayed in millions. Data from "Minnesota schools facing 'crisis level' in special education funding," by from E. Golden, January 9, 2019.

Although the state has made a concerted effort to address the special education cross subsidy there has to be more done to ensure that it doesn't continue to grow in the future, at a minimum freezing it at the current level. Lawmakers must also consider adding an equalized levy to fund the remaining cross subsidy. The steps will allow for the basic education formula to provide an adequate education to our general education population.

Safe Schools Levy

Strom (2018) explained, "The safe schools levy, formerly known as the crime levy, allows school districts to levy [a per pupil amount that may be used for expenses related to] student and staff safety issues" (p.100). Furthermore, Strom (2018) delineated that eligible expenses include: school resource officers, drug prevention programs, gang resistance training, school security, other crime prevention and student safety measures, and counseling social workers. (p. 100). This revenue stream does not generate enough revenue to support the need that local school districts have when it comes to safe school activities being offered.

For fiscal year 2015 and later, the safe schools revenue was increased to $36 per pupil unit for safe school activities (Strom, 2018, p. 100). The revenue is paid 100% by local taxpayers, with no equalization aid provided by the state. Minnesota lawmakers need to recognize the landscape at local school districts and give school boards the authority to levy an appropriate amount that would meet all of the district's safety needs. The state of Minnesota has one of the worst student to counselor ratios in the United States and ranks 49 out of 50 (News Tips, 2009, p.1). In Moorhead Area Public Schools, this researcher's place of employment, a social worker was finally added for the 2019-20 school year at the middle school campus. The social worker serves 2,200 students. Before this additional staff member was added, a social worker covered both the district's middle and high schools, responsible for 4,000 students. Allowing this local levy to be increased would benefit school districts by taking pressure off the basic education formula and allowing districts to use those funds for their intended purpose. State legislators need to recognize the need in this area and allow for an increase in the funding on per pupil basis through a statutory change, by increasing the amount to a minimum of $72 per pupil with some equalization attached to that increase, which would allow more property poor school districts to collect the revenue without an undue burden on their taxpayers.

Transportation

According to Strom (2018), the state of Minnesota mandates that a school district provide transportation to and from school for any student who lives two or more miles from school. This mandate includes both public and nonpublic students. In addition, school districts are required to provide certain transportation services for students with disabilities, provide transportation for nonresident, open enrolled students from the serving school district boundaries, and provide transportation for resident students that attend a charter school that is located in the resident school district boundary (Strom, 2019, p. 37). As a result, student transportation costs vary

greatly between districts. Other factors impacting transportation include the number of students per square mile in the district, the age of the transportation fleet, and the location of schools in the district. Strom (2018) referenced that the 1995 Minnesota Legislature made extensive modifications to pupil transportation funding programs (p. 37). The categorical transportation funding programs were replaced with an increase to the basic education formula by $170 per pupil, regardless of how much the formula had generated for a district prior to the change.

Furthermore, Strom (2018) detailed that to offset some of the revenue differentials that were no longer accounted for within the $170 per pupil that was added to the basic formula allowance, the 1995 Legislature also added transportation sparsity and transition revenue. Transportation sparsity is a revenue stream added to the general education revenue program to help school districts with low population densities due to changes made to transportation categorical aids. Transportation sparsity could be used for general operating purposes and those expenses did not have to be tied to student transportation (Strom, 2019, p. 31).

The Moorhead Area Public Schools continues to lose revenue in student transportation since the legislative changes of 1995 and the $170 roll into the basic education payment, even with the fiscal year 2018 changes that allowed school districts to use transportation sparsity to include adjustments based on the school district's unreimbursed transportation costs. This adjustment does not cover the expenses included in student transportation. This researcher recommends that the state of Minnesota consider bringing back the transportation categorical revenue funding through an equalized formula. In 1997 the per pupil payment was $3,505 and $170 dollars that were rolled into the basic education formula. This $170 represented 4.85% of basic education formula. This researcher recommends that transportation revenue should be reinstated at the same 4.85% of basic formula allowance, currently at $6,312. This would mean

the transportation formula would be funded at $306 per pupil. This researcher also recommends that the funding would be tied to the basic formula allowance. Table 18 represents the reinstated transportation aid amount.

Table 18: Reinstated Transportation Aid

Basic Formula Allowance	Percent of Basic Formula	Total Dollar Amount
$3,505	4.85%	$170/pupil
$6,312	4.85%	$306/pupil

Long Term Facility Maintenance Revenue

The condition of school facilities has been correlated to school climate, student achievement, absenteeism, and teacher retention. Yet facilities funding typically reflects even greater inequities between the metro and non-metro communities than instructional and operational costs. Minnesota has frequently relied on local property taxpayers to carry the burden of facilities costs, and because property values differ greatly between districts, inequity in facilities funding is a problem, and has resulted in property wealthy districts more easily being able to invest more in expanding and improving facilities, while poor districts struggle to maintain and build quality school buildings.

Strom (2018) explained that, “In 2015 the Minnesota Legislature created a program to support facility needs for school districts, charter schools, and cooperatives that also included intermediate school districts” (p. 48). Strom (2018) described the Long Term Facility Maintenance revenue (LTFM) as a per pupil, formula-driven revenue source that was set to start with the 2016-17 school year. The LTFM program can only be used for deferred maintenance projects, increasing facility accessibility, and health and safety projects.

LTFM is provided through a per pupil allowance. The program was phased in over a three-year period. The per pupil allowance for fiscal year 2017 was $193, for fiscal year 2018 the per pupil allowance was $292, and for fiscal year 2019 and later the per pupil is $380 per pupil unit (Strom, 2018, p. 49). Because it is now fixed at $380 per pupil, Legislators need to recognize that LTFM will soon fall behind without any increases to the per pupil funding levels. LTFM needs to be adjusted each year by some measure, in order to continually increase the revenue per pupil. The allowance could be tied to the general education formula allowance in the future, or adjusted by a measure of inflation, in order to help build in continual increases to the LTFM allowance. Figure 5 displays the impact of not linking the LTFM formula allowance to a revenue source or measure that tends to increase over time. Without that the increase the revenue would soon be flat and potentially affecting school districts negatively.

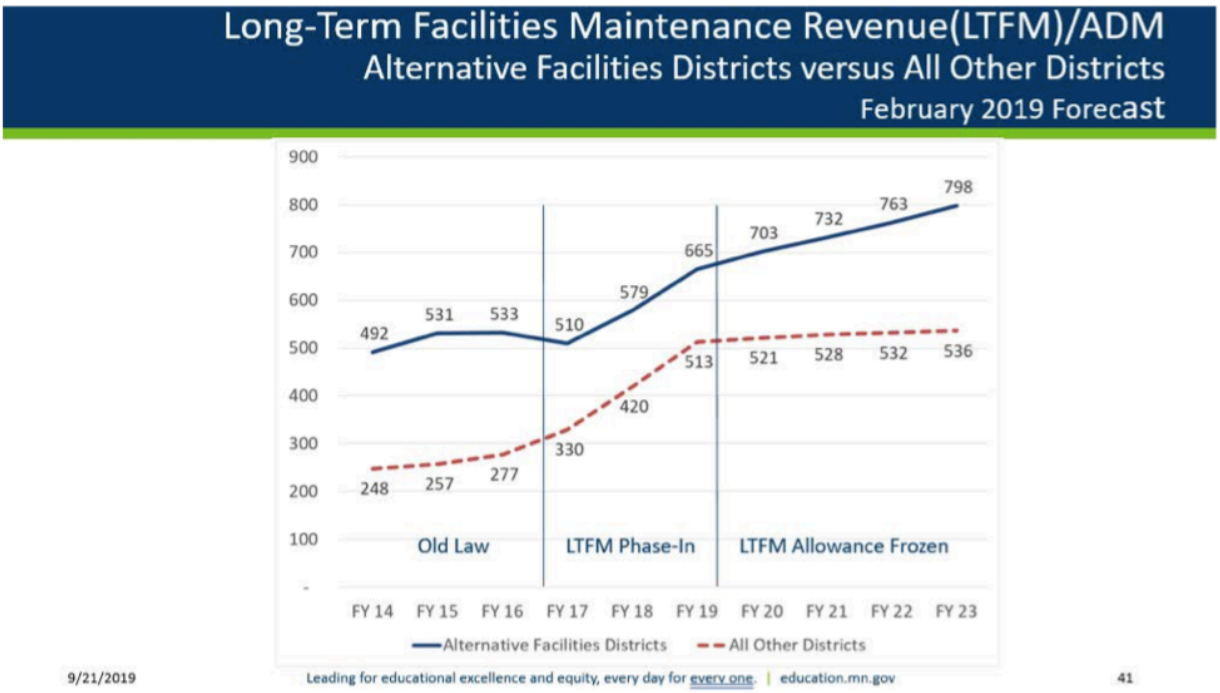


Figure 5 Long-Term Facilities Maintenance Revenue (LTFMR)/ADM (Minnesota Department of Education, 2019). From "2019 Delegate Assembly Resolutions and Background Information," by Minnesota School Boards Association (Eds), 2019, p. 8.

The legislature must also review the LTFM average building age requirement. Currently, districts only qualify for the maximum amount of revenue if their average building age exceeds 35 years. This requirement is not conducive to a growing school district that added square footage to the district, which could reduce their average age below 35 years. For example, in 2015, the Moorhead Area Public Schools passed a $78.2 million bond referendum for capital facilities improvement. That bond resulted in the construction of two new schools and added new square footage as a result of the construction. This new construction reduced the average of the facilities in the district from 32 years old to 26 years old. This reduction is average age resulted in the school district losing LTFM revenue as the average decreased. However, although the district-wide age dropped, the amount of buildings and square footage did not, resulting in the school district having to maintain more facilities and more square footage with less revenue. The average age of facilities needs to be held harmless if the school district does not reduce buildings or older square footage as a result of construction. Contrast this with another district, the Brainerd School District, which is completing over $200 million worth of facilities work, with a mix of remodeling of existing buildings and new construction of building additions and a new elementary school, and because the average age of buildings in the district remains above 35 years, when construction is completed, they will not lose any LTFM. This needs to be corrected for districts that are building new spaces due to enrollment increases and not reducing their original footprint before construction started.

Recommendations for Future Studies

1. Future studies should be completed to ensure that basic education revenue is continuing to reach near perfect equity in the distribution of revenue on a statewide basis.
2. Future studies should include the adequacy component of the basic education revenue component. The current per pupil allowance is $6,312 in Minnesota. The state needs to

identify an amount per pupil that is adequate enough to carry out the basic education program for a K-12 student in Minnesota. Once this number has been established it should help legislators to determine if it is meeting the needs of the local school districts across the state through the component of horizontal equity. Identifying this number should help legislators to identify a specific target amount in dollars to reach over future legislative sessions.

3. Future studies should also include a review of all the components that make up the general education program, including a review of whether all the categorical funding components are helping to achieve vertical equity through equitable distribution of the revenue on a statewide basis. As the state of Minnesota becomes more diverse in student populations, the state needs to continue to evaluate how it can continue to improve the equitable distribution of categorical revenue on a statewide basis.

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